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and Draft Environmental Impact Statement
Volume II - Chapter 4 and Appendices

BLM

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Introduction

This chapter analyzes the environmental impacts and effects of implementing each alternative described in Chapter 2 except the proposal to create the Lake Havasu Regional Management Area because the proposal to create the area is not a land use plan level decision. Existing conditions described in Chapter 3 comprise the baseline used for projecting impacts. Management that could impact resources or resource uses has been analyzed and the conclusions drawn from that analysis are described under the appropriate resource consequence section.

RMPs provide broad guidance and are generally not intended to be site- or project-specific. Most impacts discussed in this chapter are general in nature. Implementation of the RMPs occurs through site-specific projects and activity plans; these steps frequently require a separate and more detailed National Environmental Policy Act (NEPA) analysis.

Many management actions are common to all alternatives or two or more alternatives. Similarly, the impacts associated with implementation of a given set of management actions may be common to a range of alternatives or even to several seemingly disparate resources and uses. When a proposed activity is not addressed in a specific section, no impact is anticipated.

Resource topics are presented in the same order as in Chapter 2. Under each resource topic, Chapter 4 discusses the consequences of no change in current management (Alternative 1) and then describes the changes in impacts under Alternatives 2, 3, 4, and 5 (Preferred).

Cumulative Impacts

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality regulations require federal agencies to consider the cumulative impacts of their actions. Cumulative impacts may be defined as the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person

undertakes those actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

The future foreseeable actions would include the following:

- Population growth in and next to the planning area, which would increase residential and commercial development on private lands;
- Continued grazing;
- Potential minerals development;
- Increased recreational uses on Bureau of Land Management (BLM) lands;
- Activities on lands under the jurisdiction of other federal and state agencies.

The alternatives could affect several resources and resource uses, including soils, air quality, water resources, and social and economic conditions.

Urbanization, mineral development, and increased outdoor recreational use of private and state lands in the planning area are likely to continue throughout the life of the Resource Management Plan (RMP). Cumulative impacts on wildlife might include the loss of wildlife habitat, including Sonoran and Mojave Desert tortoise, endangered species, migratory birds, bats, fish habitat, and migration corridors in the planning area on adjacent federal, state, and private lands.

Cumulative impacts are addressed at the end of each resource section.

Analytical Assumptions

The following general assumptions and guidelines were used to facilitate the analysis of environmental consequences. Other assumptions specific to a particular resource are identified under that resource.

General Assumptions

- Funding and personnel will be sufficient to implement any of the alternatives as described in Chapter 2.
- The laws, regulations, and policies that direct BLM work would be applied consistently across all alternatives.
- All alternatives will maintain the vegetation resource and meet needs for water, nutrient, and energy cycling.
- Because previous plans (including Yuma District Resource Management Plan [YRMP], the Kingman Resource Area Resource Management Plan, the Lower Gila South Resource Management Plan, and the Lower Gila North Management Framework Plan) have been in effect 15 to 20 years, it is assumed that the approved RMP would have a similar planning horizon.

- Short-term impacts are those expected to occur within 1 to 5 years of implementing the activity. Long-term impacts are those that would occur after the first 5 years of implementation.
- Recreational use within the planning areas will continue to increase.
- The area of residence of at least 70% of the summer visitors to the BLM lands in the planning area is San Bernardino and Riverside, (California) Counties. It is assumed that the 70% share will remain constant throughout the planning horizon.
- Appendix B lists the regulatory directives with which all activities must comply and which limit the range of management actions.

Specific Resource Assumptions

Wildlife Habitat

- The loss of any wildlife habitat would cause a reduction in wildlife populations.

Cultural Resources

- Cultural resources would continue to deteriorate through natural forces, visitation, and vandalism if no corrective or preventive action is taken.

Rangeland Resources

- Current trends in livestock market conditions would continue. Livestock values would therefore remain the same as at present.
- Assessments of vegetation-related impacts are based on expectations of normal precipitation during the life of the plan.
- Long-term grazing use levels would be based on monitoring information, including utilization studies and actual use data.

Land Ownership Adjustment

- Fair market value would be received for all public lands sold. Land exchanges would involve lands of equal value.
- All disposal land is free of encumbrances and has been identified for disposal.

Rights of Way

- Site-specific impacts caused by development of facilities in designated corridors or communication sites would be assessed in accordance with NEPA using an Environmental Assessment or EIS process prior to approval by BLM.

Recreation

- Visitor use of public lands would continue to increase at present rates. Current types of recreation use would continue in the future unless otherwise stated.

Wilderness

- Under the Arizona Desert Wilderness Act of 1990, five Wilderness Areas (WAs) (i.e. East Cactus Plain, Gibraltar Mountain, Harcuvar Mountains, Rawhide Mountains, and Swansea) would continue to be managed by BLM under the Wilderness Act of 1964.
- Under the California Desert Protection Act of 1994, portions of three WAs (i.e. Whipple Mountains, Chemehuevi Mountains, and the Dead Mountains) would continue to be managed by the BLM under the Wilderness Act of 1964.
- Under the Arizona Desert Wilderness Act of 1990, BLM will continue to manage one Wilderness Study Area (WSA) (i.e. Cactus Plains).

Minerals

- The federal government would retain all mineral rights on public lands identified for disposal where valuable minerals are known to occur.

Threatened and Endangered Species

- Compliance with Section 7 of the Endangered Species Act of 1973 (ESA) would be completed before implementing specific projects resulting from RMP decisions.

Types of Effects To Be Addressed

This chapter describes the anticipated direct, indirect, and cumulative impacts of implementing Alternative 1, the No-Action Alternative, and each of the four additional alternatives.

The impacts of the planning decisions on the visitor experience depend on the expectations and values of the individual visitor. A particular action could benefit some users and have a negative effect on others. The degree of impact would also vary relative to user sensitivity. Sensitivity will vary among different user types and may also differ between new users and traditional users of a particular resource.

The impact analysis identifies effects that may enhance or improve a resource as well as those that may degrade a resource. Evaluations are confined to actions that have direct, immediate, and significant effects on the planning area, rather than identifying and evaluating every minor interaction and cause-effect relationship.

Incomplete or Unavailable Information

Federal regulations (43 CFR 1502.22) mandate that agencies evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS must identify incomplete or unavailable information, if that information is essential to a reasoned choice among alternatives. This EIS is based on the best available data for each resource. However, for one resource (paleontological resources), locality data exist for only a small portion of the planning area. In several other cases, specific data that contribute to an understanding of the resource are incomplete. The list below describes the incomplete or unavailable data status for the paleontological resource and for specific data that contribute to other resources.

Transportation: Hiking, equestrian, mountain bike, and/or otherwise non-motorized trail inventory was begun in 2003. Most of the trails inventoried are around Lake Havasu City, meaning only about 5% of the planning area has been inventoried. Non-motorized trails would be included in the Travel Management Network (TMN) Plan. However, being non-motorized in use, the off-highway vehicle (OHV) area designations may not apply.

Water Source Inventory and Hydrology Data. Water resource data is abundant for surface and groundwater usage/supply, but water quality data for all water sources is inconsistent and often obscure, particularly regarding aquatic organisms. Data scarcity influences the evaluation of effects on water resources. Because of all of the variables associated with water quality, mixed ownership/authority, water uses, and designated beneficial uses, the effect of impacts from proposed actions can only be roughly estimated.

Paleontological Resources. While most of the planning area has not been surveyed for paleontological resources, BLM has a map showing paleontologically sensitive areas where resources are known or suspected to occur.

Ecological Site Inventory Data. Data is available for most of Lake Havasu Field Office (LHFO), but not all. The Soil and Vegetation Inventory Method

conducted in the late 1970s and early 1980s covers most of the field office. An ecological site inventory was conducted on the Bill Williams River in the mid 1990s. The lack of data in some areas could influence the evaluation of effects on natural resources.

Noxious Weed Inventory. Limited site-specific data is available in some areas through inventory or monitoring studies. An area of concern has been identified through an interagency group that included the Mohave County Cooperative Extension Service, Arizona Department of Agriculture, Havasu National Wildlife Refuge, Bureau of Indian Affairs, and private landowners, as well as BLM. Data is available on the Colorado River through the U.S. Bureau of Reclamation (BOR). Site-specific data is not available for the entire planning area, and its absence may influence the evaluation of effects on some resources.

Summarized Critical Elements

There would be no known adverse impacts on certain critical elements of the human environment. These elements include prime or unique farmlands, floodplains, and hazardous or solid waste. This plan has not addressed these critical elements because they are not present in the planning areas or would not be affected by the management activities under the alternatives. These critical elements would be considered, as suitable, in site-specific project design and implementation processes. Each of these excluded elements is discussed below.

Prime and Unique Farmlands. There are no prime or unique farmlands or farmlands of statewide or local importance, on public lands within the planning areas. None of the actions associated with the alternatives analyzed in detail would disturb farmlands. Therefore, impacts on prime and unique farmlands are not analyzed further.

Floodplains. Although floodplains exist in the planning areas, no projects or activities resulting in permanent fills or diversions in, or placement of permanent facilities on, active floodplains of major rivers are projected to occur with implementation of any of the proposed alternatives. Therefore, impacts on floodplains are not analyzed further.

Hazardous and Solid Waste. None of the actions, activities, and uses projected to occur with implementation of the plan alternatives would require the handling, storage, or release of significant quantities of these wastes. Therefore, impacts on or from hazardous and solid wastes are not analyzed in detail.

Indian Trust assets are lands, natural resources, money, or other tangible assets held by the federal government in trust or restricted against alienation for Indian tribes and individual Indians. BLM determined that the actions described in this land use plan will not affect Indian trust assets.

Impacts on Air Resources

Direct impacts to air resources have not been identified regardless of the alternatives as a result of proposed management decisions from: biological resources, paleontological resources, rangeland and grazing management, special area designations, wilderness characteristics**,** visual resource management, and wild horses and burros.

From Cultural Resource Management

Managing areas for public use such as Swansea townsite could increase visitation and dust generated from vehicle traffic. No other impacts to air resources are anticipated.

From Lands and Realty Management

A total of 56,715 acres of public land is identified for disposal under Alternative 5 (Preferred). Disposal of these properties for development may increase particulate concentrations. Parcels associated with the Colorado River corridor may provide further recreational access to the water and thereby lead to increased boat traffic, noise, and accumulated exhaust fumes. This acreage is greater than Alternatives 1 and 2, smaller than Alternative 3, and similar to Alternative 4.

Actions that permit soil disturbance such as utility/transportation corridors, telecommunication sites, access roads, alternative energy production sites, and concessions, could pose local, short-term fugitive dust impacts.

Acquisition of easements to access mineral rights and/or Recreation and Public Purposes Act (R&PP) leases could decrease short-term air quality through dust generation. Other industry-specific air impacts would depend on the proposed use and would be assessed in an Environmental Assessment.

From Minerals Management

Dust and airborne particulates would be generated from mineral development. The magnitude of the effect would depend on the proposed activity, location, and site-specific geologic variables. These impacts would be mitigated on a case-by-case basis to maintain visibility. Suppression of noise and dust would also be addressed as a routine part of the permitting process.

Any other potential air resource impacts would also be treated as part of the permitting process to develop the target mineral resource, and the associated Environmental Assessment. Impacts to air resources from Alternative 5

(Preferred) would be less than Alternatives 3 and 4, and slightly greater than those of Alternative 2.

Authorization of community pits and expansion of areas open to mineral material disposal in Alternatives 3 and 4 would increase potential for degradation of air resources on and off site. Although this outcome could impact air resources beyond the level of Alternative 1, each proposal would again be assessed on a site-by-site basis. Maintenance of high-quality air resources would remain the goal. The moratorium on community pits and the restriction of mineral development in special management areas called for in Alternative 2 would reduce the potential for impacts on air resources below that expected from Alternative 1.

From Recreation Management

Establishment of Recreation Opportunity Spectrum (ROS) across the planning area, and recognition of Special Recreation Management Areas (SRMAs) will produce interdisciplinary activity plans for each defined unit. These plans will result in better understanding of air impacts from recreational activity, and where needed, provide management and monitoring to limit air quality degradation.

This recreational management progression promises long-term improvement for air resources on Lake Havasu, and heavy-use off-highway vehicle (OHV) areas. This promise is contingent on the short-term development and implementation of cooperative, coordinated plans that recognize impacts to air resources and that manage for episodes of extensive recreational use (e.g., holidays and special events). Development of interim interdisciplinary management plans prescribed for Lake Havasu will have trivial effect on boat-generated noise or concentrated boat exhaust fumes.

Increasing recreational development and visitation along the Colorado River has brought concentrations of vehicles and vessels that escalate exhaust fumes to unsafe levels on busy weekends when the weather is hot and calm. Noise from accumulated boats has also escalated to nuisance levels that approach, and in heavy traffic periods, exceed, EPA and OSHA suggested noise levels for public health and welfare. Participation in a coordinated lake management plan for Lake Havasu would be intended to unite diverse social and environmental authorities on this multi-interest body of water to balance recreational use with environmental thresholds. Exhaust fumes generated by internal combustion engines would be addressed on the reservoir through a plan of this sort. Better monitoring, law enforcement, and progressive long-term improvement in air quality would result.

Proposed development of recreation facilities on the water's edge could concentrate gas engine exhaust from vehicles and/or vessels. On still days these fumes can accumulate to dangerous levels at the surface of the water.

The Standard Wash and Osborne Wash Recreation Management Zones (RMZs) would be managed to promote OHV activities. These areas would be designated as limited to existing trails. On completion of required cultural and biological evaluations, they could be designated open. This open designation would dramatically increase the potential for soil disturbance, fugitive dust, and particulates generated during periods of high recreational use. During periods of high winds combined with use, visibility down wind could be impaired, that may affect traffic on State Route (SR) 95.

Continuation of the Parker 400 race route concentrates dust along the route that may impact visibility and elevate suspended particulates (dust) for several miles downwind.

Allowing further development of concessions and other recreational facilities throughout the planning area on currently undeveloped public land would increase noise, dust, and exhaust levels coinciding with periods of high visitation. Concentrated public access at existing developed recreational sites lends to dust and—with concentrated use—accumulation of exhaust fumes. This activity leads to both direct and indirect impacts to air resources with long-term implications.

Development of a Long-Term Visitor Area (LTVA) could impact air resources by generating fugitive dust and smoke from concentrated campfires in the winter. The development of LTVAs also presents potential for concentrated engine exhaust that could produce short-term localized air quality concerns above those of the existing situation.

Alternative 5 (Preferred) has the best potential for reducing impacts to air resources from recreational activities. Alternatives 1 and 2 provide management to sustain current air quality conditions; however, they do not take steps to address the growth of recreational use within the area. Air quality could degrade over the long term under Alternatives 3 and 4 because of further promotion of recreational opportunities on public land and the assumption that ongoing development must meet an ever-increasing demand for public land. Visibility would probably decline, while exhaust fumes, human waste odors, and airborne particulates would increase.

From Transportation and Public Access

Land use allocation objectives target the need to designate existing routes and close/reclaim trails that are causing resource damage, violate route designation criteria, or exceed limits of acceptable change. The allocations and actions proposed would curb route proliferation by designating approved routes, signing designated roadways, outlawing cross-country travel, driving in wash bottoms, and closing unneeded trails where damage to resources is evident. Traffic would be confined to routes already disturbed, and dust generation across the landscape would be limited. This approach would minimize air impacts in undisturbed soils and would potentially reduce dust and other contaminants produced by OHV traffic. The Alternative 5 (Preferred) and Alternatives 2 and 4 include

rehabilitation of soils in closed routes. This management approach would reduce impacts to air quality resources beyond the existing conditions (Alternative 1).

Open OHV areas at Crossroads and Copper Basin Dunes create long-term fugitive dust issues that may cause downwind particulate and visibility impacts as far away as several miles from the activity. The close proximity to major roads presents increasing public safety visibility risks from dust. These two areas would continue to be allocated as open to OHV activities and will have air impacts in the form of dust and noise. Generally Alternative 5 (Preferred) has similar impacts air resources as Alternative 1 (No Action), which may increase localized particulate concentrations above ambient air standards near areas of high OHV use into the long term..

Alternative 5 (Preferred) specifically limits vehicle travel on public lands to less than 4% of the planning area. Dramatic growth in the area combined with more powerful vehicles has resulted in a proliferation of roads and trails in the desert surrounding population centers. In turn, that development has increased disturbed soils, airborne dust, and particulates in the area of use, and in off-site areas downwind. With the increase in traffic both on and off road, noise has also increased.

From Fire Management

The magnitude of fire impacts to air quality depends on many variables. These potentials have all been described in the *Arizona Statewide Land Use Plan for Fire, Fuels, and Air Quality* (Bureau of Land Management 2004).

Wildfire will cause short-term consequences to air quality in terms of elevated smoke and particulates until fire suppression actions are successful. Although smoke and particulate matter are unregulated during wildfire episodes, BLM fire suppression efforts would monitor air quality conditions and make every reasonable attempt to minimize problems where possible.

In the case of prescribed fire or fuel reduction actions, potential impacts to air resources would be addressed beforehand in a specific NEPA document. All prescribed fire activities are required to follow Arizona Department of Environmental Quality (ADEQ) smoke management regulations. Through this planning process, a treatment prescription would be developed to minimize air quality degradation, and the prescribed conditions would be satisfied throughout the treatment to maintain suitable air quality conditions. These conditions would be monitored during treatment to assure success. If air quality is compromised during fuel reduction treatments, adjustments would be made where possible to reduce impacts.

Cumulative Impacts to Air Resources

Growth in the LHFO area should continue into the foreseeable future. Within the planning area, 64% of lands are public; however, within the Colorado River corridor, the majority of lands are comprised of private, tribal, and Arizona State Trust properties. Growth is concentrated in the river corridor, and most growth will continue there. With the continued use and development of BLM neighboring lands, dust is likely to persist as a problem in the planning area into the foreseeable future. Air resources on public lands may be affected by off-site use and development regardless of the RMP alternative selected.

The Colorado River corridor also serves an expanding clientele of boating recreationists. The public boater can access and impact air resources on public lands from many jurisdictions beyond the control of BLM. Of primary concern is noise pollution to sensitive shoreline and aquatic habitats from individual vessels or groups of vessels that exceed established noise limits. At peak times Lake Havasu now has more than 4,000 vessels moving about on the lake's surface. Concentrations of one vessel/5 acres are not uncommon with at least four separate areas experiencing concentrations of 20 vessels/acre. The ever-increasing concentration of vessels on the river and reservoir on most summer weekends creates a cumulative noise level that now is potentially harmful to human hearing, and may be harmful to wildlife as well. This growing cumulative impact could best be managed through development of a cooperative lake management plan as proposed in the recreation alternatives.

Growth beyond public lands will continue to impact the quality of air resources on both the land and the water. In the long term, fugitive dust, particulates, noise, and engine exhaust contaminants will increase with population. Although negative effects to air resources from this alternative will be inconsequential over the short term, as cooperative activity plans are completed and implemented on Lake Havasu and in other areas, the long-term impacts to air resources should stabilize on public lands. Conditions, in fact, may actually improve, given technology shifts and public education.

The quality of air resources should sustain attainment status. Regional development will increase emissions and generate dust that will impact visibility. If popularity of OHV traffic continues, particulates and dust in popular recreational areas may exceed standards during periods of extensive use.

Boat noise and boat exhaust would not be controlled and would likely increase along the Colorado River. Areas with concentrations of low-speed boat traffic would experience periods of degraded air quality that might exceed public and wildlife health standards. Areas of high-speed traffic would likely experience periods of noise levels exceeding 86 decibels at a distance of 50 feet, the noise threshold at which Arizona boating law is violated. (OSHA imposes limits of 85 decibels as the maximum ambient noise level in the workplace. EPA suggests 75 decibels at a 50-foot distance to protect human health and welfare.)

Impacts on Water Resources

Direct impacts to water resources have not been identified as a result of proposed management decisions for biological resources, cultural resources, paleontological resources, special area designations, wilderness characteristics**,** visual resource management, and wild horses and burros. This condition holds true for all alternatives.

From Rangeland Management/Grazing

Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Standards and Guidelines) will direct all future grazing administration under this plan. That document affirms commitment to stable watersheds without degradation of water resources. To comply with the intent of Standards and Guidelines, there can be no long-term degradation to water resources on public lands. Due to the ephemeral nature of many allotment lands covered by this plan, seasons of use will be during cooler months. This practice will disperse livestock concentrations away from surface water to further eliminate traditional grazing impacts to water resources.

Potential for short-term impacts to water resources exists in allotments associated with Alamo Lake as a watering source; however, any short-term impacts would be identified and adjusted through Standards and Guides before becoming chronic long-term impacts.

From Lands and Realty Management

Land Tenure

Potential Land Tenure adjustments under this alternative could accelerate development of the Colorado River shoreline and neighboring portions of the watershed. This outcome could increase runoff, nutrients, and sediment rates to the river and reservoir that would stress beneficial uses of surface water resources through non-point pollution. This approach could also potentially add to current vessel congestion on busy holiday summer weekends. For example, videos by BOR showed more than 4,000 vessels on Lake Havasu during a helicopter overflight made Memorial Day weekend of 2005. The level of vessel concentration at which water resources are impacted from fuel leaks and exhaust concentrations is not clearly understood, but the concentration of boats on Lake Havasu far exceeds suggested levels on other reservoirs (National Park Service 2002), and at some point the effects of such concentrations may impair beneficial uses. Alternative 3 identifies the most land for disposal, whereas Alternative 2 identifies the least; therefore lesser impact on water resources is expected from Alternative 2.

Retention of BOR withdrawn lands assures a land buffer between population centers and Colorado River surface water that helps sustain suitable water resource conditions.

Acquisition of private lands with water rights could increase the amount of surface water and therefore increase available water resources in the Bill Williams River corridor. Alterative 1 (No Action) seeks to acquire 3,720 acres on the Bill Williams River, whereas Alternatives 2, 3, 4, and 5 (Preferred) use criteria to prioritize land acquisitions.

Use Authorizations

Actions that permit soil disturbance such as utility/transportation corridors, telecommunication sites, access roads, alternative energy production sites, and concessions, could pose local erosion risks and create potential pollutant sources that may impact beneficial uses of surface and/or groundwater resources.

The impacts of use authorizations can only be assessed on a site-by-site basis through the NEPA process.

From Minerals Management

Mineral development can pose significant impacts to water resources for both surface and groundwater sources. The magnitude of such effects depends on the proposed activity and on site-specific geologic variables. Because of this variability, mineral development impacts to water resources are best assessed and addressed on a site-specific basis through the development, permitting, and NEPA process.

Groundwater resources would be impacted by mineral management in the form of leachate from the mine workings, but a significant impact could also be the consumptive use and "mining" of scarce groundwater resources to recover minerals. Biannual assessments have expressed concern about several aquifers in this area over concentrations of radiochemicals, dissolved solids, and nitrates. The cause of these elevated concentrations and their effects are uncertain (Arizona Department of Environmental Quality 2002)

Through Alternatives 3, 4, and 5 (Preferred), authorization of community pits and expansion of areas open to mineral material disposal would increase potential for water resource degradation both on and off site into the long term. Although this outcome could impact water resources beyond the level of Alternative 1, each proposal would again be assessed on a site-by-site basis by multiple authorities with the goal of maintaining water supplies and all beneficial water qualities.

In Alternative 2 impacts to water resources would be similar to Alternative 1: the moratorium on community pits and the restriction of mineral development in

special management areas could reduce long-term potential for impacts to water resources below that expected from Alternative 1.

From Recreation Management

Within the Lake Havasu Field Office, the 1987 YRMP produced a decision that all present recreation sites would continue to be used and managed for recreation, and that lands would be available for recreational expansion as long as that expansion did not degrade the full integrity of natural values. That decision has been carried across all alternatives in this new planning document. Many of these recreation sites adjoin surface water. The water is the recreational attraction, and the vitality of the facility depends on the quality, availability, and sustained productivity of that aquatic resource. Some of these facilities may directly impact surface water resources over the short term, and others could directly impact surface water resources into the long term.

The total number of boaters on this river segment on any given day is an unknown figure, but many residents believe boats are becoming too concentrated. The Lake Mead EIS (U.S. Department of the Interior 2002) on the river reach directly upstream from this subject area sought to limit boater access, primarily because of the water quality impacts from vessel fuel spills, environmentally harmful vessel exhaust constituents, and other boater wastes.

Essentially, boats with internal combustion engines make relatively invisible wastes that can concentrate with increased boat traffic to toxic levels both in the air and the water. Some of these materials may quickly volatilize (evaporate) while others will stay suspended in the water and others will sink to the bottom. This impact is potentially difficult to detect since water impairment may be toxic only until chemicals evaporate or they accumulate on the bottom (a condition that may be very difficult to reverse). Boating access from existing facilities may currently be causing both short- and long-term impacts to water quality, primarily by an increase in popularity, and boat concentration.

Other recreational facilities that may impact water resources are boat-in campsites. These rustic facilities offer a unique outdoor experience, but constant vessel beaching and foot traffic in relatively concentrated areas tends to compact soils. Such compaction tends to increase long-term shoreline erosion into the lake (U.S. Department of Agriculture 2002). In these areas, vegetative cover that provides shade and stabilizes soils is lost. As shoreline soils erode, water loses depth and grows warmer with increased solar radiation. Over the long term this condition may expand reservoir surface area, thereby decreasing aquatic habitat potentials and increasing the consumptive evaporation of water. Typically, this phenomenon is accelerated by boat wakes in the summer when water levels are highest in the lower Colorado River.

This water resource impact is certainly exacerbated by non-point source pollution from rapidly growing communities and existing minerals or other pollutants passed from the many upstream water users. Both the lake bottom and shoreline

administered by BLM are public recreational assets because of the water resources that join them. All Colorado River segments addressed in this Resource Management Plan (RMP) are proposed to be included in SRMAs for which specific plans will be developed as a result of this RMP. Actions to perpetuate the health of water resources will be addressed in each of those future plans.

Alternative 5 (Preferred) relegates future recreational development to be in support of ROS settings and establishes seven SRMAs. Alternative 5 (Preferred) also establishes a remedy mechanism for long-term past recreational impacts to natural resources throughout LHFO lands. This alternative impacts water resource least relative to other alternatives into the long term. Impacts to aquatic resources caused by recreational use will be addressed in an interim management plan developed prior to an SRMA plan. Ultimately, a Coordinated Lake Management Plan will identify such effects and how they might be remedied in future cooperative plans. Decreasing long-term impacts to water resources is contingent on completion and implementation of these plans. Similarly, terrestrial SRMAs could reduce soil impacts from OHV activities, and the plans need to be completely implemented to realize the water resource benefits promised in the detailed cooperative plans.

Continuation of shoreline camping at all developed campsites may produce long-term impacts to the water resource for fish and wildlife in some sensitive settings with limited water circulation. Continued public camping on undeveloped shoreline could impact water resources through an increase in vehicle and vessel disturbance, loss of vegetation, soil compaction and erosion, waste management, and fire risk.

Alternative 1 (No Action) limits further development of recreational facilities (LTVAs, concessions, and campsites) on public lands. This outcome would conserve consumptive use of water resources and minimize potential impacts to water quality, especially when these facilitates are in areas with hydrologic connection to perennial surface water or within close proximity to that surface water. This limitation would maintain the natural function and sustain ephemeral water resource benefits to perennial surface waters. Alternatives 2, 3, 4, and 5 (Preferred) support the development of recreation facilities and infrastructure on public lands. This approach could increase non-point sources of pollutants and make potential hydrologic modifications that could impact downstream water resources into the long term with increased sediment yields.

The elimination of vending on Lake Havasu endorsed in Alternative 2 would offer short-term, site-specific water resource benefits, particularly because no location would be provided where boats would congregate. Boaters would be dispersed and would present fewer impacts to water resources. Under Alternatives 3, 4, and 5 (Preferred), vending would be permitted on Lake Havasu and impacts could be expected.

Proposals to develop existing open space on the Parker Strip for recreational purposes may impact water resources through removal of shoreline vegetation that filters suspended materials from the passing water, cools it, and stabilizes the

river banks from erosion. This development would also increase parking areas that would enhance runoff from soil compaction/pavement, increase solid and human waste, and escalate non-point sources of pollutants.

The proposal to increase the number of overnight campsites accessible by boat along the California shoreline could impact water resources in the same fashion as discussed above for increasing the number of locations on the Arizona shoreline, and will be further addressed in the cumulative effects section.

The Standard Wash and Osborne Wash RMZs would be managed to promote OHV activities. These areas would be designated as limited to existing trails until completion of required cultural and biological evaluations, at which time they could be designated open. This open designation would dramatically increase soil disturbance, compaction, soil erosion, and water yield directly to Lake Havasu that could cause short term impairment of receiving waters for short terms following runoff events. Over the long term this accelerated erosion could gradually increase wetlands where sediments are deposited in the lake.

Development of recreational shoreline fishing access points along the river could impact water resources through non-point pollutants generated from parking areas, potential sediment generated from foot trails, and solid waste where it is inadequately managed.

From Transportation and Public Access

Land use allocation objectives call for development of a TMN plan that would designate travel routes. Proposed management actions state further that this plan will identify route conflicts with sensitive wildlife habitat and mitigate those issues. The identification of highly erosive routes causing water resource impacts would also be a priority in this plan. Mitigation of these conditions could stabilize and improve the condition of water resources. This approach could create moderate short-term reductions in eroded soils and sediment sources to surface water resources, but in the longer term the impact would affect a broader area and help sustain the designated beneficial uses of surface water resources.

Development of a Lake Havasu shoreline trail could impact water resources with both solid and human wastes. A significant portion of this proposed area is steep, highly erosive terrain where trails may concentrate runoff and increase sediment yields to surface water. This outcome could produce both on- and off-site, long-term impacts to water resources.

Alternative 1 (No Action) specifically limits vehicle travel to existing roads and trails on more than 95% of public lands in the planning area. However, dramatic growth in the area combined with more powerful vehicles, has resulted in a proliferation of roads and trails in the desert surrounding population centers on BLM and other lands. This growth in OHV trails has increased disturbed soils, often on steep, erosive slopes, within the two river watersheds. Long-term

sediment yields (to include salts and other minerals) have also increased to downstream surface water resources.

Alternative 1 (No Action) maintains the designation of Standard Wash as an OHV area. Community growth and increased visitation has likely expanded OHV watershed disturbance in this ephemeral Colorado River tributary. The 18-square-mile (11,588-acre) watershed contains a vast road network that has disturbed soil crust, compacted soils, and decreased vegetative cover in this sandy/rocky terrain. Runoff yields and sediment generated directly to Lake Havasu have likely increased proportionally over the short-term past. That impact may accelerate into the long term from continued use. As surface soils erode, the salt- and mineral-rich sub-soils will be exposed to the erosive process and impacts to the water quality of Lake Havasu will be compounded. Compaction of soils throughout this watershed from OHV traffic may also impact water infiltration and percolation to the aquifer, thereby impacting potential groundwater recharge.

Alternative 3 designated one limited route in Aubrey Hills for all users. The traffic could create direct soil disturbance, resulting in long-term sediment transport to Lake Havasu.

While Alternative 5 (Preferred) and Alternative 4 encompass protection of sensitive areas, they also encourage OHV use. This encouragement may concentrate such use and accelerate transport of soils and minerals eroded to Lake Havasu and/or the Colorado River. To speak strictly in terms of sediment generation, this alternative presents soil erosion potentials less than Alternative 3 but greater than Alternative 2.

From Biological Resource

Recommendations to manipulate and/or restore vegetative composition, particularly in riparian habitats, could cause short-term erosion and impact surface water resources in the immediate area with increased sediment and salt concentrations. These alternatives may also impact surface water resources through increased consumptive use or evapo-transpiration from the adapted plant communities.

The proposal to maintain brush installations for fish habitat improvements in Lake Havasu may affect water quality in the water column directly around this added structure. As the organic material decomposes, there could be a very slight fertilizing effect in the immediate area over the short term. As the physical structure matures into the long term and is colonized by invertebrates and other simple life forms, water clarity may improve, with slightly elevated concentrations of dissolved oxygen.

The proposal to create backwaters could impact water resources by increasing water consumption from evaporation of the additional surface water and transpiration of vegetation surrounding it. Submerged and emergent vegetation

may impact water quality by bio-accumulation of dissolved salts, minerals, and heavy metals. Development of these backwaters may also impact water quality through decreased water circulation within the backwater resulting in low dissolved oxygen levels, and the potential of salt concentration leaching from the surrounding soils

The recommendation under Alternatives 2, 4, and 5 (Preferred) for "no wake" zones on Lake Havasu could decrease reservoir bank erosion from boat wakes, thereby sustaining shoreline soil stability and water resources.

Alternatives 3 and 4 allow for increased vehicle access to the Bill Williams River that could directly and indirectly impact water quality and aquatic habitat conditions if vehicles were allowed to operate in or near the river or floodplain. Vehicular river crossings should be avoided, as should vehicle routes that parallel the channel. Routes in close proximity to surface water progressively degrade water resource qualities.

No impacts to water resources are anticipated under Alternative 1 (No Action).

From Fire Management

The magnitude of fire impacts to water resources depends on many variables. These potential impacts have all been described in the *Arizona Statewide Land Use Plan for Fire, Fuels and Air Quality* (Bureau of Land Management 2004). Of particular concern within this RMP area is riparian habitat.

Always situated in direct proximity to water resources, the riparian community typically produces substantial fuel loads of "undesirable" or "exotic" vegetative species. These areas are where people recreate, and accidental fires can be expected regularly. When such areas are dry during hot weather, they can produce extremely hot fires that denude soil resources and accelerate short-term erosion. Fires in these communities impact water resources by degrading water quality in the short term with sediment and nutrients. Longer-term impacts include decreased shade though burned vegetation, and increased solar radiation to the water that can increase both water temperature and evaporation rates.

As stated in the fire alternatives, where fuel loading is high, but conditions are not suitable for fire treatments to reduce fuel, other means such as mechanical, chemical, or biological methods may be utilized to achieve vegetative resource objectives. These treatment types present an entirely different array of potential impacts to water resources, and these impacts may be manifest over a longer term. Because of the tremendous diversity in site-specific variables and potential treatments, these impacts can only be assessed on a site-specific basis. The need to reduce fuel loads must be weighed against the resource risk of other treatment and in consideration of the potential for enhanced resource conditions. While this sort of deliberation is impossible prior to an unexpected wildfire, this approach can be taken where a planned or controlled prescribed fire will be used for resource management purposes.

In the case of controlled burns or fuel-reduction actions, potential impacts to water resources would be addressed beforehand in a specific NEPA document. Through this planning process, a treatment prescription would be developed to minimize degradation of water resources, and the prescribed conditions would be satisfied throughout the treatment to maintain suitable water conditions. Prior to treatment, detailed resource objectives should be defined and measured, then monitored following treatment to assure success or to adjust treatment for improved success of future treatments.

Fire typically produces short-term impacts to water resources such as flood and landslide potential and the resultant water quality problems caused by elevated sediment and nutrient load. These impacts vary according to the magnitude of the burn, together with geologic and climatic variation. However, fire can be very beneficial to water resources over the long term insofar as the land management following fire encourages the growth and establishment of a robust, desirable plant community on the affected watershed.

Cumulative Impacts to Water Resources

Surface water resources will be affected throughout the Colorado River reach from upstream influences and from activities on the watershed not a result of BLM actions. Development of non-BLM properties within the floodplain likely poses the greatest direct cumulative threat to surface water quality. Development of other lands beyond the floodplain could also contribute significant non-point source contaminant loads during periods of runoff or through return flows of used water. Improvements in infrastructure (e.g. utility corridors, roads etc) allowed through the alternatives indicate and support population growth within the local communities that would pose progressively escalating demands on an already stressed water resource supply. Consumptive/non-consumptive water demands could increase, as well as the potential for impairment of designated beneficial uses by non-point pollutant sources.

Human population growth and resulting development of infrastructure will produce more boating enthusiasts who will desire more convenient points of water access. Each proposed boat ramp or marina will further concentrate vessels on the river and/or reservoir, potentially contributing to the existing litter, human waste, fuel/exhaust chemicals, and shoreline erosion concerns. During brief episodes of contaminant input from high use or runoff, the water column will likely exceed standards for some beneficial uses, and accumulated contaminants in reservoir sediments could build to greater concentrations within the food chain (bio-accumulate), impacting other beneficial uses.

Much of the existing development along the Colorado River is a result of previous government plans dating back to dam building, and the Lower Colorado River Land Use Plan of 1964. Subsequent land transfers to Arizona State Parks, State Lands, and other interests have promoted shoreline development with abundant potential for further shoreline development on Lake Havasu. Each of these development potentials present water quality and quantity issues that can

only be assessed on a proposal-specific basis, but each adds to cumulative impacts. These impacts would best be resolved in a cooperative, proactive manner as proposed in this RMP.

The proliferation of OHV trails also tends to spread, causing further watershed disturbance that accelerates erosion and may increase runoff. This increased sediment/pollutant yield delivered to the river, and accumulated in the reservoirs will first impact navigation, fish/wildlife habitat, and swimming near population centers or areas of high use.

Recurring, long-term impacts to water resources are also incurred on the Bill Williams River through a low-water crossing in association with a gas pipeline that crosses the river on Arizona State land. This river crossing, used by public land OHV traffic, could impact river water quality and aquatic habitat conditions in BLM wilderness areas downstream. The crossing directly impacts river reaches nominated for Scenic River status.

Shallow shoreline cove areas with poor water circulation—the places coveted most for water recreation and wildlife habitat—are most vulnerable to degradation. Deeper bottom habitats near inflow areas are also vulnerable. Mid-channel areas typically have a higher movement of water that discourages deposition.

abandoned mine lands affiliated with BLM and other property owners are abundant through the watershed in certain areas. Although it is BLM policy to remediate these potential sources of pollutants they persist on the landscape, and remain a cumulative potential pollutant for both surface and groundwater resources. The quality of designated beneficial uses such as fishing, swimming, boating, and wildlife habitat could be degraded through the life of this plan, and should be monitored closely in a coordinated forum of water user interests. These water resource impacts from other landowners, combined with the impacts from BLM actions through this RMP discussed above, comprise cumulative impacts to water resources in the future.

Impacts on Soil Resources

Direct impacts to water resources have not been identified regardless of the alternatives as a result of proposed management decisions for rangeland and grazing management, visual resource management, wilderness characteristics and wild horse and burro Management.

From Cultural Resource Management

Managing sites for public use may increase visitation and traffic that may increase soil disturbance and erosion, but prescriptions to preserve cultural

values, restrict camping, firewood collection, and vehicle access also indirectly protect (or at least maintain) soil resources.

From Lands and Realty Management

Land Tenure

Lands listed for disposal in the Colorado River corridor will likely be developed and may accelerate soil erosion and sediment impacts to the river. Use authorization impacts to soil resources will be addressed in individual NEPA documents. Effects depend entirely on site-specific requirements made on future land disposals, use authorizations, compliance monitoring, and adaptive management.

With the issuance of additional R&PP leases it must be recognized that potential further development of properties for recreational purposes will not only impact on-site soil resources, but also off-site soil resources, particularly where public access to the Colorado River is provided.

Use Authorizations

Actions that permit soil disturbance such as utility/transportation corridors, telecommunication sites, access roads, alternative energy production sites, and concessions can pose direct or indirect impacts to soil resources. These activities could degrade off-site soil resource productivity through construction-related erosion or compaction and further degrade off-site resources through sedimentation and water pollution.

Application of Best Management Practices should be applied on a site-by-site basis for any and all of these soil-disturbing activities to minimize short-term impacts and avoid long-term resource degradation that could threaten the stability of even the constructed facility.

Acquisition of easements to access mineral rights, Special Management Areas, and/or R&PP leases could increase soil disturbance, erosion rates, and sediment transport to impact other resource values.

In terms of use authorizations, Alternatives 3 and 4 propose to expand utility and highway corridors along with communication sites. These activities could increase soil disturbance proportionally above that in Alternative 1 (No Action). This approach should increase soil erosion on site and could cause off-site sedimentation impacts. Utility corridors also often impact the landscape with dust and wind erosion. All these potential actions and impacts would be addressed and mitigated in site-specific environmental documents.

From Minerals Management

Soils in areas open to mineral material development would be impacted. Proper site planning and development can only minimize impacts. Site rehabilitation standards should be established and bonded prior to development to avoid long-term impacts that could permanently affect site productivity and impact off-site features both directly and indirectly. Generally, impacts to soil resources would have to be assessed for each independent proposal.

Prohibited surface occupancy within 0.25 mile of surface water features protects soil stability in those corridors and would inhibit potential indirect impacts to surface water quality. Otherwise, impacts to soil resources would have to be assessed on a site-by-site basis.

Alternative 2 prohibits community pits and restricts mineral development in special management areas; soil resources would potentially sustain lesser impacts from mineral development than in Alternative 1 (No Action). Authorizing community pits and opening expanded areas to mineral material disposal under Alternative 3 would increase soil disturbance and impacts beyond the level of Alternatives 1 and 2.

From Paleontological Resource Management

Preservation of these scarce resources would maintain soil stability.

Designating areas of invertebrate and plant fossil wealth for recreational collectors and equipping these areas with interpretive signage, could create popular attractions with the potential to produce direct, long-term soil impacts from erosion. Effects would vary depending on the location, magnitude, and popularity of specific sites. Where fossils are located in marine sediments high in salt concentrations, this practice could also liberate salt from wind or water transport to increase salinity of Colorado River waters.

From Recreation Management

Alternative 5 (Preferred) specifies that future recreational development will support ROS settings and establishes seven SRMAs for which special management plans will be developed. It also establishes a remedy mechanism for long-term past recreational impacts to resources throughout LHFO. The management vision established in these seven distinctly separate areas covered in this alternative provide the best soil conservation options of this suite of alternatives into the long term. However, completion and implementation of these plans must be implemented and monitored to realize those soil improvements. Soil impacts stated in Alternative 1 will continue into the foreseeable future, until those SRMA plans are complete, implemented, and disturbed soils rehabilitated.

Limiting development of additional recreational facilities would maintain the current condition of soil resources. However, desert soils recover from compaction and erosion impacts at an imperceptibly slow rate. In the case of rill and gully erosion, soil impacts can expand and continue for decades, affecting large tracts of the watershed. Therefore, stopping further recreational development does not equate with stopping past impacts to soil resources from recreational activities on public lands. Conversely expanding and developing additional recreation facilities though Alternatives 3, 4, and 5 (Preferred) will continue to degrade soil resources into the long term both on and off site.

The entire LHFO area is open to camping with a 14-day limit. Some areas have proven quite popular with winter visitors and desert areas near highways have become camping areas throughout the cooler months. Attractive locations are likely used by campers repeatedly. In these popular locations this relentless use will result in soil compaction that will severely limit vegetative cover. Without restrictions this open status could spread into more popular areas to denude ever larger areas and lead to long-term declines in vegetative productivity and soil loss. Traffic patterns will powder surface soils and compact sub-soils. Over time wind erodes the surface and the low linear track on a gradient becomes a water drainage pattern with the potential to become a gully, resulting in direct and indirect soil impacts.

Similarly, boat shoreline use in developed (permit required) and undeveloped (day use only) Lake Havasu areas disturb shoreline soils from the high water mark at 450 feet above sea level to an area likely affected by prop outwash at the back of the vessel (445 to 442 feet). This repeated activity maintains a constantly disturbed shoreline soil at these recreational locations, prohibiting vegetative re-generation to stabilize these sites. The continued disturbance also tends to wash out fine-textured soils resulting in an “armored” shoreline of rock and cobble that is a poor seedbed to promote vegetative soil stability. The alluvial, poorly consolidated soils at most of these sites are then subject to relentless wave action, human tromping, and vessel beaching that would continue to degrade shoreline soils between 450 feet and 442 feet above sea level into the long term. Adjoining shoreline campsite soils are also compacted, and de-vegetated, further compounding soil impacts to an extent both above and below the water level.

Impacts to soil resources in the Colorado River unit from more numerous public access recreational facilities would have to be assessed on a site-by-site basis relative to the magnitude and use proposed. Impacts to soil resources from proposals to enhance public access to the shoreline could be minimized through site-specific remedies; however, proposals to increase vessel or vehicle concentrations on or near the river could create an indirect impact of larger magnitude to soil resources. To further emphasize and promote recreational activities across the planning landscape would increase impacts to soil resources.

Long-term camping allowed in concession areas within the 100-year floodplain has produced a highly paved or compacted soil resource that increases runoff from precipitation events, producing indirect soil erosion and generating eroded soil or pavement wastes to the river or reservoir.

The proposal to establish additional LTVAs would result in direct soil impacts to the footprint of the development from compaction. This outcome may result in erosion to an area approximately twice the size of the footprint along with long-term vegetative decline in productivity. However if LTVAs were not considered/established (Alternative 2), winter campers would likely move to unrestricted areas far away from current development. This customer shift would compact and denude soils in desert areas to the east that are currently only slightly impacted where they are impacted at all.

Open OHV areas at Crossroads and Copper Basin Dunes, create long-term soil impacts that may affect soil resources of the entire designated area directly. Indirect impact from wind and water erosion of disturbed soils may persist for miles around. OHV use in the Standard Wash area has similar impacts to those experienced in the "open" areas.

Development of a comprehensive Lake Management Plan could help users and developers better understand the value of stable soil in terms of upland soil productivity, wildlife and fish habitat diversity, lake water quality, lake sediment constituents, and reservoir storage capacity.

ROS implementation categorizes the landscape into settings that will be maintained through management, and potentially aid in long-term soil stability.

Continuation of the Parker 400 race route concentrates direct and indirect soil impacts in an already impacted environment.

Development of recreational facilities in the floodplains of desert washes could deflect or impinge runoff to otherwise stable soils and thereby increase channel erosion and instability. This type practice involves investment and liability risks that should be avoided. If floodplain facilities are absolutely necessary, the Corps of Engineers must be consulted for permitting.

Saving undeveloped properties on the Parker Strip from further recreational development should maintain existing soil conditions. By limiting camping to established resorts and existing campsites, impacts to soil would also decrease from this activity. In the long term, recovery of impacted soils outside these campsites would be promoted.

Prohibiting recreational firewood collection under Alternative 2 would allow the slow, natural accumulation of persistent woody debris across the landscape that may build organic soil amendments and create micro-climates for new seedlings. This approach would improve soil stability and productivity over the long term.

Relaxation of camping rules and firewood collection throughout the management units would contribute to an expansion of compacted soil resources. The area of bare ground would progressively increase, along with wind and water erosion, causing direct impacts to the non-regulated area, and long-term indirect impacts to off-site resources through eroded soils.

From Transportation and Public Access

Allocations and actions proposed under all alternatives would curb route proliferation by designating approved routes, signing designated roadways, outlawing cross-country travel and driving in wash bottoms, and closing unneeded trails that damage resources. Traffic would be confined to routes already disturbed, and new soil disturbance would be limited across the landscape.

Excluding wilderness and priority habitat areas, past management plans have protected soil resources from vehicle traffic on only 1.9% of LHFO lands, while vehicle access to the remaining lands has been limited to existing roads and trails. However, as communities have grown, the popularity of desert motor sport and exploration has dramatically expanded existing road and trail networks across the public landscape. In some areas such as Standard Wash, thousands of acres are covered by a random, concentrated complex of trails. Soil resources have been directly compacted on these trails, vegetation potential pulverized, and the protective surface broken to enable wind and water erosion. Long-term impacts have resulted and will likely continue both on and off site.

To leave navigable washes open until they can be signed otherwise is to perpetuate soil compaction that disturbs soil surfaces and inhibits vegetative growth. These washes left in open status also encourage OHV enthusiasts beyond route networks that may encourage or necessitate cross-country travel to return to a desired location. Continued OHV use of washes perpetuates this soil-disturbing activity and increases vulnerability to flood damage. Other proposed actions would seriously limit open OHV traffic and enhance soil stability.

Increasing public access to the Bill Williams River canyon and river may increase soil disturbance and potentially increase erosion directly from those access routes into the long term.

Although these unauthorized trails can be closed and rehabilitated, the practice is expensive and management-intensive. On the remote public landscape of the magnitude addressed in this plan, repairing the damage is not feasible. Controlling the damage is the only hope for sustained, productive soil resources.

Alternative 2 includes rehabilitation of soil resources on closed routes; however no measure is taken to mitigate existing vulnerability to water erosion or the resulting sediment generated from the compacted road surfaces to reservoirs and waterways.

Concentrated public access at existing developed recreational sites leads to sustained soil compaction and surface erosion that reduces vegetative vigor and increases runoff. This runoff could encourage gully formation and will generate sediment to waterways. This activity leads to both direct and indirect soil resource impacts with long-term implications.

Proposed development of staging areas and foot trails around the water's edge would expose soil resources to accelerated erosion and compaction both on and off site.

Limiting traffic on the Parker Strip to designated routes and trails should limit further soil impacts from vehicles, although existing road impacts should cause long-term erosion, compaction, and sedimentation impacts both on and off site.

Opening designated routes in Aubrey Hills to traffic would create direct soil disturbance along those designated routes that are currently seldom used and result in long-term erosion damage on site, potentially accelerating sedimentation to Lake Havasu.

From Biological Resources

Impacts to soil resources would be short in duration, would be mitigated on site, and would contribute to long-term soil stability and improved productivity.

Wood collection would be actively managed, as would other activities that disturb vegetation in ways that would indirectly and directly aid soil stability and productivity. Under Alternative 3 wood collection would not be managed, and impacts to soil resources would be sustained to an extent proportionally greater than Alternatives 1 or 2.

These actions seek to optimize vegetative cover and naturalness that in turn sustains soil resource stability and productivity. Reseeding and site rehabilitation following construction disturbance would be used to limit soil impacts to short-term erosion.

Recommendations to manipulate vegetative composition can increase short-term soil erosion, particularly in riparian habitats. In some cases, soil chemistry can limit the success of these practices and lead to long-term soil impacts, but these concerns should be addressed in site-specific planning documents.

Proposed restoration of riparian habitats may cause short-term impacts on soil resources through mechanical or other disturbance required to remove existing vegetative cover in favor of desired plant communities that would be planted.

All other proposed actions should maintain or improve the current condition of soil resources.

Desired future conditions to restore wildlife habitats may involve vegetative treatments. Such treatments would require soil disturbance to manipulate existing, unsatisfactory vegetative communities to desired conditions. Soils are diversified throughout the area. Some areas may contain elemental constituents that limit vegetative community composition and vigor. If these sites were disturbed for these purposes, elemental soil concentrations such as salt, selenium, or metals around old mines may seriously limit vegetative success and thereby

contribute to direct erosion losses from both wind and water. Beyond that particular concern, objectives described here would increase soil cover, lower runoff and wind-generated erosion, increase the water infiltration rate into soils, and potentially increase soil stability and productivity.

The creation of backwaters along the Colorado River to benefit native species may directly impact site-specific soils through short-term erosion increases from waves, wind, and water runoff.

Leadership of community awareness programs to utilize Best Management Practices within the river watershed might directly decrease soil erosion from construction in areas of high population growth.

The establishment of in-stream flows in the Bill Williams River below Alamo Dam has been partially achieved through a cooperative release program with the Corps of Engineers. Habitat improvement has been occurring with dependable water supplies, but when inevitable flood waters arrive, flood releases must be passed downstream. Flooding flows may scour the canyon bottom, impacting floodplain soil resources directly and for the long term. Soil resources in BLM canyon bottoms directly below the dam may become scoured and eroded to bedrock due to high-velocity flood releases from the dam. Flood flows into Lake Alamo deposit most sediments in the delta, leaving flood releases through the dam relatively sediment-free. These high-velocity releases from the dam are by nature highly erosive and carry only fine-textured, highly mobile suspended sediment downstream to the Colorado River. These flood release flows thereby erode soils below the dam without depositing them, and degrade riparian potential for several miles below the dam through the export of soil resources from the stream reach.

From Fire Management

Fire impacts to soil resources depend on fuels, fire intensity, soil type, fire suppression actions taken, and landscape characteristics. Such impacts can only be predicted with information specific to the site and the actions taken. Effects can be beneficial, negligible, or catastrophic. For the purpose of this RMP, wildfire will be suppressed, and if soil stabilization actions are required to mitigate wildfire impacts, those actions and options will be specifically addressed in a separate NEPA document.

In the case of prescribed burns or fuel reduction actions, impacts to soil resources will then be addressed again in a specific NEPA document completed prior to the action.

From Special Area Designations

Areas identified will contain special soil resource conservation guidelines that will attempt to remedy soil impacts of past management, where feasible, and to

mitigate those of the present and future. There are no significant impacts to soil resources from any of the alternatives listed in this section.

Cumulative Impacts to Soil Resources

Growth in the LHFO area should continue into the foreseeable future. Within the planning area, 64% of lands are public; however, within the Colorado River corridor, the majority of lands are comprised of private, tribal, and Arizona State Trust properties. Growth is concentrated in the river corridor, and most growth will continue there. Soil characteristics through this corridor have been and will continue to be modified. A growing portion of soil resources will be compacted or paved by various activities throughout the watershed, regardless of ownership. This condition will be concentrated within the river corridor and likely increase water and sediment yield of high-intensity storms. Public resources may ultimately sustain impacts through increased channel erosion rates throughout the watershed with sediment deposition in waterways. Predictive broad-scale modeling of soil erosion cannot be accurately performed at present because of the lack of soil survey interpretation

Liberal transportation guidance enables a high density of dirt trails and access through sensitive soils, including desert washes. Recreational development of Colorado River shoreline has compacted and denuded significant soil resources causing long-term erosion, sedimentation, decreased vegetative diversity, and loss of habitat productivity. Establishment of SRMAs and special area designations provides future detailed planning efforts for a large portion of the planning area that will better define soil resource issues, mitigation, and remedies. Open camping and firewood collection has led to diminished organic soil matter, decreased vegetative vigor, soil compaction in roads and campsites, and increased wind and water erosion rates. Local flood property damage may also increase, and sediment, nutrient, and salt problems with surface water resources may also result.

Effects of soil-disturbing activities on public lands will combine with those discussed above to produce cumulative impacts to soil resources.

Impacts on Biological Resources

This analysis addresses potential impacts to biological resources for the LHFO RMP alternatives. This analysis will focus on those management alternatives or actions that have the potential for physical disturbance of habitat, loss of habitat, and the loss or disturbance of special status and priority species (see Tables 3-3, 3-4, and the priority plant list in Chapter 2) within the planning area. Impacts can be direct or indirect.

Direct impacts result from an activity or action that affects, through no other means, a change of existing conditions or practices in a given species or

population. Indirect impacts result from an activity or action that, through associated effects, can be reasonably linked and thereby shown to be contributing, to the change of existing conditions or practices of a given species or population.

Indirect impacts to biological resources may occur when actions result in environmental changes that indirectly influence the survival, distribution, or abundance of native species (or increase the abundance of undesired nonnative species). Examples of indirect impacts may include effects of noise, barriers to migration, presence of chemical contamination, or incidence of human activity levels that may disturb or harm wildlife.

Cumulative impacts can result from recent, ongoing, or planned projects that, in conjunction with proposed project activities, affect species and populations that are known to comprise the biological resources in the project area.

The following are considered to be impacts to biological resources; these impacts may be short- or long-term:

- Result in either direct or indirect harm to, harassment of, or destruction of individuals of any species listed as endangered, threatened, or rare under federal or state law, regardless of duration of impact. Species to which this classification applies include state- and federally listed, proposed, as well as, candidate species, species of concern, or other species that are demonstrably rare, threatened, or endangered.
- Cause substantive chronic or acute toxicity or bioaccumulation of contaminants in biota, or inhibit revegetation or recolonization of the site as a result of discharge of toxic compounds at the surface and/or subsurface of a disposal site, or through exposure of toxic compounds during dredging activities.
- Cause the loss or long-term degradation (including changes in species composition and abundance) of a sensitive habitat, defined as habitat that (1) provides essential resources that are otherwise limited on a regional scale; (2) serves as a concentrated breeding, nursery, or foraging area; or (3) supports substantial concentrations of sensitive species.
- Violate local, state, or federal laws with respect to the protection of biological resources, regardless of duration of impact.
- Disrupt the feeding, breeding, nesting or roosting habits, directly or indirectly, of special status species (including federally and state-listed species, California fully protected species, BLM sensitive species, and species of concern) or their habitats, as designated by federal, state, or local agencies.
- Result in substantial loss, reduction, degradation, or disturbance in native species habitats or in their populations. These impacts could be short- or long-term impacts; for example, short-term or temporary impacts may occur during project implementation, and long-term impacts may result from the loss of vegetation and thereby loss of the capacity of habitats to support fish

and wildlife populations. Degradation of native species could also result from introduction of invasive exotic species.

- Result in a net loss of riparian area or habitat value, either through direct or indirect impacts to riparian or wetland vegetation, loss of habitat for wildlife, degradation of water quality, or alterations in hydrological functions. This classification includes riparian habitat and federally protected wetlands.
- Result in substantial loss, reduction, degradation, or disturbance of sensitive plant communities and habitat types.
- Result in substantial interference with the movement of any resident or migratory species of fish or wildlife or with established native resident or migratory wildlife corridors.
- Conflict with any local policies or ordinances protecting biological resources; or conflict with the provisions of an adopted habitat conservation plan, species recovery plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Avoidance is the preferred method to prevent loss. If an alternative to prevent the loss of habitat is not available, then the action should be designed to reduce impacts to all affected areas.

From Cultural Resource Management

Cultural resource management guidance prohibiting surface disturbance near known archaeological sites would indirectly protect vegetation and wildlife habitat in those areas. Measures taken to stop, limit, or repair damage to cultural sites from looting, vandalism, or natural causes may include route closures, restrictions on grazing, construction of fencing, and erosion control measures. These measures may provide increased incidental protection to vegetation and wildlife at these locations.

Increased visitation to culturally important mining areas would directly affect the bat population in the associated mines within the area and without protection these mines would pose as a public safety risk.

From Rangeland Management/Grazing

Adherence to Arizona Standards for Rangeland Health and Guidelines for Grazing Administration would result in favorable direct impacts to vegetation and wildlife habitat by reducing soil erosion and promoting the development of riparian and wetland plant communities. Adhering to Standards and Guidelines, would have positive long-term impacts to biological resources by maintaining the ecological rangeland condition for those areas currently in healthy condition and by improving those areas that are currently substandard, which would ultimately improve priority plant and wildlife habitat.

Direct impacts from grazing on plant cover and biomass are documented, and decreases in shelter sites have been shown to be associated with a decrease in the diversity and abundance of lizards and other wildlife species in arid ecosystems (Lovich and Bainbridge 1999).

Natural recovery of habitats exposed to grazing depends on the intensity of the past grazing and the local conditions. In some cases, exclusion of grazing for more than 14 years has not allowed recovery of native perennial grasses in southeastern Arizona. The practices of rest rotation, deferred rotation, seasonal or short-duration use, or other management systems to promote ecosystem health may not work in improving vegetative conditions, decreasing the impacts to wildlife, and/or decreasing impacts to watersheds. Generally in desert environments, protection from grazing does not stop land degradation. Drought, erosion, human disturbance, and sand encroachment continue to degrade land in the absence of grazing. Human activities and grazing may hasten degradation; when drought is added to the equation; the three together can cause extensive erosion and degradation to the land (Lovich and Bainbridge 1999). If livestock grazing is discontinued on an allotment administered by LHFO, the area would also need to be closed to other activities to allow the allotment to return to natural conditions for supporting native species listed in Table 4-1 below).

Table 4-1. Threatened, Endangered, and Special Status Species Potentially Affected by Grazing Allotments

		Alternative			
Allotment	Species Impacted	1 (No Action)	2	3	4 and 5 (Preferred)
Alamo Crossing	Southwestern Willow Flycatcher	No	No	No	No
	Yellow-billed Cuckoo	No	No	No	No
	Bald Eagle	Yes	No	Yes	Yes
Babcock	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Crossman Peak	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Ganado	Sonoran Desert Tortoise	Yes	No	Yes	Yes
	Death Valley Mormon Tea	No	No	Yes	Yes
	Scaly-stemmed Sandplant	No	No	Yes	Yes
Hancock	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Harcuvar	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Havasu Heights South	Sonoran Desert Tortoise	Yes	No	Yes	No

Table 4-1. Threatened, Endangered, and Special Status Species Potentially Affected by Grazing Allotments

Allotment	Species Impacted	Alternative			
		1 (No Action)	2	3	4 and 5 (Preferred)
Lamberson	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Leidig	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Loma Linda	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Muse	Death Valley Mormon Tea	No	No	Yes	Yes
	Scaly-stemmed Sandplant	No	No	Yes	Yes
Nine Mile	Death Valley Mormon Tea Scaly-stemmed Sandplant	Yes	No	Yes	Yes
Orosco	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Planet	Lowland Leopard Frog	Yes	No	Yes	Yes
	AZ Toad	Yes	No	Yes	Yes
	Sonoran Desert Tortoise	Yes	No	Yes	Yes
	Southwestern Willow Flycatcher	No	No	Yes	Yes
	Yuma Clapper Rail	Yes	No	Yes	Yes
	Yellow-billed Cuckoo	Yes	No	Yes	Yes
	California Black Rail	Yes	No	Yes	Yes
	Bald Eagle	No	No	Yes	Yes

Table 4-1. Threatened, Endangered, and Special Status Species Potentially Affected by Grazing Allotments

Allotment	Species Impacted	Alternative			
		1 (No Action)	2	3	4 and 5 (Preferred)
Primrose	Lowland Leopard Frog	Yes	No	Yes	Yes
	AZ Toad	Yes	No	Yes	Yes
	Sonoran Desert Tortoise	Yes	No	Yes	Yes
	Southwestern Willow Flycatcher	Yes	No	Yes	Yes
	Yuma Clapper Rail	Yes	No	Yes	Yes
	Yellow-billed Cuckoo	Yes	No	Yes	Yes
	California Black Rail	Yes	No	Yes	Yes
	Bald Eagle	Yes	No	Yes	Yes
Salome	Sonoran Desert Tortoise	Yes	No	Yes	Yes
Wagner	Sonoran Desert Tortoise	Yes	No	Yes	Yes

The direct effects to grazing in riparian areas, even during a limited timeframe would lead to decreased water quality from trampling and stream bank erosion and reduced function in desired plant communities. Depending on season, intensity, and duration of use, this practice could also decrease the functional status and condition of the river channel. Feral livestock, which depend on the river for water and forage throughout the summer would present negative impacts to water quality, stream bank stability, and degraded riparian vegetation function. In the long term, impacts (including unimproved wildlife forage and a decrease in species diversity) are likely to result from management of livestock grazing practices. Vegetation and wildlife would be impacted through the introduction of livestock aggregates near water resources, resulting in increased trampling of forage and a decrease in habitat for wildlife.

Grazing to utilize big galleta grass when it is green, palatable, and abundant would decrease forage for wildlife species and decrease the big galleta grass distribution throughout the allotments.

By following the conservation targets identified by the Sonoran Desert Ecoregion Project in *An Ecological Analysis of Conservation Priorities in the Sonoran Desert Ecoregion (2000) for Cactus Plain*, the direct impacts from grazing could be minimized, but without proper research the overall impacts would not be known for several years.

From Lands and Realty Management

Acquisition of Lands

Acquisition of private lands within Category I and II desert tortoise habitat would directly protect the species and other species associated with the desert tortoise from habitat destruction. Any additional lands acquired, along with the acquisition of split estate for minerals would directly benefit wildlife by providing surface protection and adequate forage, shelter, and breeding habitat.

Disposal of Lands

Disposal of public lands would directly impact vegetation and wildlife species utilizing the area. Indirect impacts would include vegetation and wildlife habitats that are on the fringes of associated lands identified for disposal. Future development of the disposed lands would indirectly impact vegetation and wildlife habitat adjacent to those lands, due to increased human pressure on the undeveloped lands. This pressure would in turn directly impact wildlife species, including special status species such as desert tortoise, by eliminating adequate forage, cover, and breeding habitat. The disposal of large parcels of land around growing communities also eliminates the buffer zone created to protect wildlife and wildlife habitat.

Table 4-2. Disposal Acres Affecting Special Status Species and Riparian Areas

Alternative				
1 (No Action)	2	3	4	5 (Preferred)
Current Leases for Disposal under R&PP Act (acres)				
0		780		
Land Available for Sale, Exchange, and R&PP Leasing and Disposal (acres)				
51,949	34,158	83,475		56,919

Table 4-2, shows the total acreages that could potentially be disposed of that impact special status species. Although criteria for disposal protects habitat for ESA species, it does not provide adequate protection for all special status species.

Identified lands for disposal potentially impact the desert tortoise habitat on the western and eastern bajadas of the Black Mountains. Important desert tortoise habitat is present in the areas identified for disposal. These bajadas provide habitat to the largest and most contiguous known population of desert tortoises (Glenn, et. al. 1990; McLuckie, et. al. 1999). In addition some of the areas identified for disposal are within important wildlife corridors and have Sonoran Desert tortoise populations some of which are unique to the area (Goodman pers

comm.). Exhaustive survey of the lands for disposal should be completed to determine that no special status species would be affected through this action, especially since Category III desert tortoise habitat is not excluded from disposal criteria.

Use Authorizations

Rights-of-way (ROWs) and the activities that occur in these designations including but not limited to creation of wind energy and/or solar development sites, utility corridors, and communication sites, directly impact wildlife species, including special status species such as desert tortoise, migratory birds, and bat species by eliminating adequate forage, cover, and breeding habitat within that designation.

The creation of specific ROW corridors causes segmentation and barriers to wildlife movement. Continued use of the corridors will create long-term impacts to vegetation and wildlife due to ground disturbance during operation and maintenance activities. These activities can also encourage establishment of invasive species within or adjacent to the disturbed areas.

There would be direct impacts to vegetation and wildlife from the construction of facilities within ROWs. As an example, direct impacts from wind-generating equipment to special status species such as bats and migratory birds have been documented to create a decrease to species within the area due to mortality (Wind Energy Bird/Bat Workshop 2004)(Hoover and Morrison, 2005). Operation of these facilities depending on their location could create barriers to wildlife by restricting natural movement from one habitat to another and by potentially altering migratory pathways (Proceedings 2004).

The 16 multiple-use utility corridors were never physically surveyed for special status species; therefore, impacts to special status species cannot be analyzed at this time. This survey is imperative as the Colorado River watershed is an important migratory pathway for special status species especially birds and bats. Direct impacts to this important pathway could disrupt the migratory patterns and cause the mortality of numerous species. Exhaustive survey of the lands within these ROWs should be completed to determine that no special status species would be affected.

From Minerals Management

When mining activities are located within washes, important foraging, cover, and space for amphibians, reptiles, bats, other mammals, and migratory birds are affected, and ultimately the species are eliminated from the area of disturbance.

The direct impacts of any surface-disturbing activities would denude areas of vegetation, thereby reducing the amount of forage, cover, and breeding habitat

available for wildlife. Indirect impacts to wildlife would include the segmentation of habitat and barriers to wildlife movement.

Short-term impacts from mining activities include changes in wildlife behavior and immediate destruction of shelter sites. Long-term impacts include the overall change in species diversity and composition including the potential for propagation of invasive species.

Closing riparian areas within the planning area to mining operations would provide protection to aquatic habitat for species conservation. Mining activities often contribute to a degradation of water quality and closing these areas near water would protect those species utilizing the water and riparian zones.

Mining operation increase the opportunity for human harassment of wildlife species and wildlife mortality can be expected as mining activities throughout the LHFO increases.

Salable Minerals

In general the impacts from mineral material disposals are the greatest of all mining activities. The mining operations can affect large areas of land and can last extended periods with sporadic use; this is especially true of community gravel pits.

Throughout LHFO and across all the alternatives a maximum of 41% of the land is removed from mineral material disposals, and this condition provides protection to those species and habitats within these areas (see Table 4-3 below). However, this condition does not protect Category II desert tortoise habitat and those wildlife habitats found in the remaining 59% of the field office. This outcome would be in conflict with the management guidance of "no net loss" of Category II desert tortoise habitat. Although these large areas of land are open to Salable minerals, impacts would only occur where mining activities occurred.

Table 4-3. Mineral Material Disposal Acres Affecting Special Status Species and Riparian Areas

Alternative				
1 (No Action)	2	3	4	5 (Preferred)
894,890	799,680	1,101,564 acres; 60,656 acres have a time restriction due to wildlife needs	895,079	996,974 acres; 45,725 acres have a time restriction due to wildlife needs
Percentage of wildlife habitat protected from Salable mining activities within LHFO				
34%	41%	15%	34%	23%

Allowing ground disturbance in bighorn sheep lambing grounds would have the same effects as described above. Having the activities confined to the dates when bighorn sheep are not lambing would minimize some of the direct effects to ewes during lambing, but there would be a decrease in forage and shelter sites within the area for bighorn sheep and their young.

Leasable Minerals

With the entire field office open to leasable mineral activities, all the impacts associated with mining as described above could be expected. Effects would depend on the extent to which mining operations are undertaken. The restrictions on surface occupancy within riparian zones would protect special status species utilizing those riparian zones. However, allowing surface occupancy within lands allocated to conserve wilderness characteristics would have direct impacts. Disturbing the solitude of these areas could cause further stress to existing wildlife, pressuring them into smaller sections of land to survive. This outcome would decrease species diversification within these areas. The change through the alternatives in these restrictions is minimal and will not affect the levels of impacts expected.

Locatable Minerals

Recommending areas of land for withdrawal from locatable mineral entry would serve to protect wildlife and habitat within these areas. Leaving these areas open would allow for those impacts previously discussed to occur and in some cases would violate ESA by not providing proper protection to nesting bald eagles and the destruction of possible Southwestern willow flycatcher habitat.

From Paleontological Resource Management

Preserving and protecting significant vertebrate paleontological resources for present and future generations would indirectly protect the vegetation and wildlife habitat within those areas. Measures taken to protect paleontological sites from looting, vandalism, or natural degradation may include route closures, restrictions on grazing, construction of fencing, and erosion control measures. These measures may provide increased incidental protection to vegetation and wildlife at these locations.

Fossil identification and collection for both scientific and recreation purposes would have direct impacts on vegetation and wildlife habitat because of the ground disturbance inherent in the act of collection. Indirect impacts would include the increased potential for propagation of invasive and /or noxious species. Within the collecting areas wildlife would also be impacted by human use, including higher noise levels, accumulation of litter, and greater likelihood of human harassment of wildlife species.

From Recreation Management

The pursuit of the diverse recreational activities available within the LHFO planning area has the greatest potential of all BLM programs to affect biological resources. Many individuals equate satisfaction of their outdoor experience with the quality of the natural environment. Alternatives that set out to protect vegetation, fish, and wildlife habitats would increase the quality of recreation opportunities for wildlife viewing, habitat and scenic appreciation, camping, hiking, equestrian activities, and fisheries-related activities. Therefore, recreational opportunities must be balanced with the necessity to provide sustainable biological resources to maintain this relationship.

General Recreation Management

Development of recreational facilities would include, but would not be limited to, concessions, roadways, maintained foot trails, parking lots, trailheads, bridges, drainage structures, and/or ramadas. This development could directly impact vegetation and wildlife by increasing the opportunities to trample and/or denude areas of vegetation, thereby reducing the amount of forage, cover, and breeding habitat available for wildlife. These ground-disturbing activities cause an increased potential for propagation of invasive species.

Wildlife would also be impacted by human interactions, including higher noise levels, litter, and wildlife harassment. Short-term impacts to wildlife during operation and maintenance activities of recreation facilities include changes in wildlife behaviors and immediate destruction of micro-habitats from brush cutting, etc.

Specific recreational activities such as OHV use, camping, recreational shooting, paintball activities, and boating activities have similar impacts on biological resources as those mentioned above. These impacts include the increased risk of accidental fire damage to habitats and other human-induced wildlife mortality.

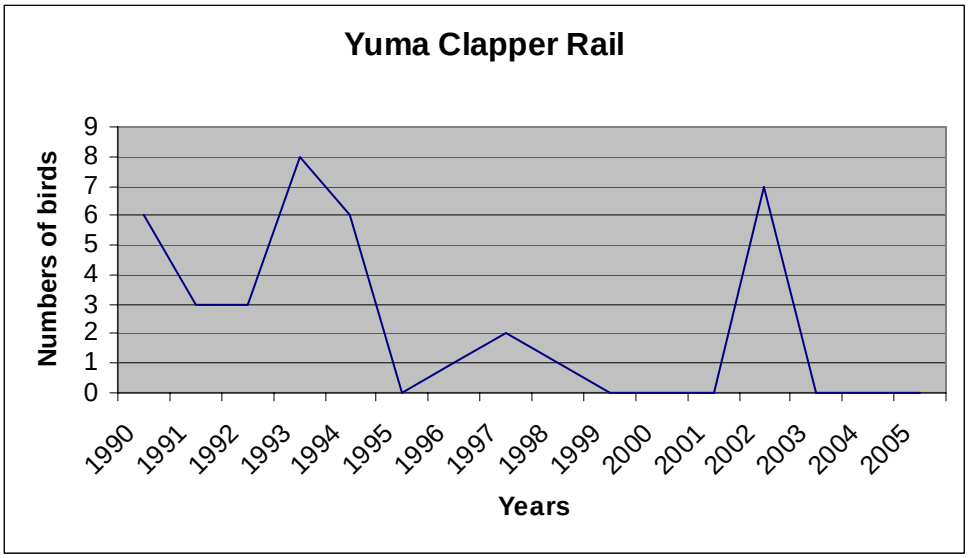
All SRMA plans should consider the goals and objectives for biological resources.

Boating and Shoreline Activities

Boat traffic through shallow water areas near shoreline areas at wake-producing speeds can suspend bottom sediment, uproot submerged aquatic vegetation, erode shorelines, and harm fish and wildlife. Important aquatic vegetation should be protected from damage due to boat and personal watercraft propellers because of its ecological importance and value of preventing shoreline erosion. Suspended sediment and erosion along shorelines increases the turbidity of the water (EPA 2001). Currently on Lake Havasu there are 83 acres of marshland habitat remaining and this number is diminishing due to increased boating

activities. Identifying important aquatic habitat for boaters with marker buoys would help to achieve the desired habitat conditions for natural resources. Education should also promote voluntary conservation and encourage responsible boating and land stewardship to preserve vegetative buffers.

Currently, the abundance and condition of emergent wetland shoreline habitat is diminishing, which directly affects critical habitat of the special status species Yuma clapper rail. The chart below shows the observed decline of the clapper rail over the recent past that coincides with increased community and water recreation growth.



Accessing the shoreline would decrease shoreline vegetation and/or increase habitat fragmentation from trampling and erosion as well as increasing siltation. The influx of trash/refuse would decrease water quality and aquatic habitat function. Loss and/or fragmentation of plant cover along the shoreline not only robs birds and mammals of food and shelter but also squeezes them onto a few small sites. Day-use boaters have been known to stop in the middle of cattails and bulrushes, disturbing numerous migratory bird species (especially the Yuma clapper rail, an endangered species). The continuous impacts over time would cause erosion of the soils and a decrease in plant cover along the shoreline.

Navigable waterways are important for wildlife diversity and camping on the sides of the lake would cause bank erosion with damage to aquatic, riparian, and wildlife habitat. Day usage randomly throughout the lake would give the public greater opportunities for human harassment of wildlife species. Dispersed boat day use could cause loss of habitat along the entire Lake Havasu shoreline. Limiting places for migratory birds to land along Lake Havasu to find food, water, cover, or space would cause possible mortality to species during their migration up and down the Colorado River. Specifically, adverse impacts could be expected for the Yuma clapper rail, other migratory birds, and other species requiring access to the water.

Because of boat activity, impacts are not limited to the recreation site but to an extended area around the site. Impacts include increased hydrocarbon pollution from boats, spillage, shoreline disturbance from wave activity, noise, trampling, and beaching of boats.

Increased boater use, shoreline camping, and fluctuating water levels are strongly correlated with water quality degradation. Increased levels of bacteria also result from improper containment and illegal disposal of waste into Lake Havasu. Additionally, water quality is adversely affected by leaving pet wastes on the shoreline, and from petroleum wastes being spilled or discharged into the reservoir. Anyone camping within 0.25 mile of the shoreline should be required to be self-contained with marine head or portable toilet. Scheduled campsite maintenance only compounds existing recreational impacts and adds the probability of garbage or waste facility overflow or spills from handling these materials.

Shoreline development can have direct impacts by altering the physical characteristics of adjacent fish and aquatic invertebrate habitats, which can result in dramatic changes in the quality of the fish community. One of the most detrimental effects of shoreline development is the removal or alteration of riparian zone vegetation. Removal of this vegetation can result in loss of fish cover and shade, which elevates surface water temperatures. Also, fish spawning habitat, such as gravel and woody cover, can be rendered unsuitable by excessive siltation and erosion. Such conditions can occur when riparian vegetation is cleared for shoreline development. Alterations in vegetation are followed by changes in insect communities, which are important food sources for fish and some waterfowl. Additionally, shoreline development often results in the removal of existing aquatic habitat (e.g., stumps, brush, boulders, etc.) in association with the construction of water-use facilities. Any thinning of low-growing vegetation would result in less stability of the shoreline where soil is the main constituent.

Each new lakeshore structure adds to the cumulative effects of neighboring structures. Boat ramps and piers add to boating pressure; shoreline development and seawalls subtract from terrestrial and aquatic habitat. Such habitat loss becomes critical when lakeshore vegetation is scarce. Expected effects of this outcome include loss of undeveloped shoreline, loss of shoreline vegetation, habitat fragmentation; increased disturbance to the aquatic life and environment from boat traffic; and increased risk of pollutant spills from parking lots, facilities, boat ramps, piers, and boating traffic. Expanded recreational boat traffic near shore areas is particularly detrimental to spawning sites and could be critical to native fish due to disturbance, noise, and siltation from prop wash. Expanded water diversions from the lake or river may impact native fish.

Fishing piers provide access to Lake Havasu that is otherwise not easily obtainable. These areas help meet shoreline fishing demand, and educate the public with no lasting or significant impacts in relation to undeveloped shoreline fishing access. Native trees are planted for shade; restrooms minimize waste; boat access is restricted; footpaths are protected; and environmental education is offered. Minor site-specific negative impacts would be mitigated by site-specific

NEPA compliance. Previously, access was only available by unimproved trails across public land, and these trails caused trampling of vegetation and accumulation of trash/refuse.

Colorado River and Lake Havasu are home to several wildlife species that are federally listed as threatened or endangered. Populations of the Yuma clapper rail (endangered species) have been displaced from the coves and any cattail area due to the recreational traffic and increased shoreline dispersed camping and/or day use on Lake Havasu and the Colorado River. Increased campsite development along the shoreline causes vegetative losses, such as cattails and bulrushes, which could also affect the two endangered fish (razorback sucker and bonytail chub). Promoting increases in recreational usage of Lake Havasu and the Colorado River has affected these species and cumulatively would adversely affect these species. Increases in utilization of the California side of Lake Havasu could also affect the threatened desert tortoise. BLM-listed sensitive and state species would be affected by any increase in recreational opportunities.

The Colorado River below Parker Dam was designated critical habitat for the razorback sucker in 1994. Increased recreational development would result in immediate loss of remaining aquatic habitat. Buffer strips, wetland creation, and shoreline habitat enhancements should be established between developments and other land or shoreline disturbances to minimize impacts. Development without mitigation would cumulatively increase loss of aquatic habitat suitable for razorback suckers, habitat fragmentation, and impact existing aquatic habitat from increased potential for water pollution, noise, and increased boat and human traffic.

Although some of the desert bighorn sheep have adapted to the current campsites and the human presence, increases in the number of sites may ultimately affect this and other species. Some species do not adapt to human presence and can be extirpated from the area.

Camping

Camping allows greater opportunities for human harassment of wildlife species and direct impacts from human interaction. The location of dispersed campers is of particular importance for vegetation and wildlife diversity. For example, camping on the sides of the washes would cause wash bank erosion with damage to woodland vegetation. Development of LTVA areas prolongs indefinitely the impacts of this recreation activity on biological resources as well as associated indirect effects.

Dispersed camping/parking could cause loss of habitat due to fragmentation caused by spur road development. Dispersed camping anywhere near open mines, shafts, or caves would impact several bat species. Dispersed camping could be detrimental to the desert tortoise, which is sensitive to any vehicular traffic (Lovich and Bainbridge 1999).

Campsites need to be located away from existing abandoned mine land sites. If campsites are created near these sites, they should be in previously disturbed areas and any safety risk sites should be removed. Any abandoned mine land sites within a 2-mile radius should be permanently closed and if wildlife such as bats are present, bat gates should be installed.

Allowing camping 0.5 mile from the maintained Parker Dam Road would require a U.S. Fish and Wildlife "take permit" for the desert tortoise, a threatened species under the ESA. Mojave Desert tortoises are found in the area west of the Parker Dam Road and they should be protected from human disturbance such as camping. Allowing camping 0.5 mile from maintained roads would also impact California state-listed endangered bat species by disrupting bat foraging and flight paths, and would provide additional human access to bat habitat.

Firewood

Direct and indirect effects can occur due to the wood collection process. Firewood collection includes persons driving to the site and removing dead and down material. Dead and down material provides nutrients for plant growth. Material removed from the ground can be considered a short-term effect causing a decrease in shelter for various species including herpetofauna. Maintaining bush piles, snags, and downed wood is essential for maintaining healthy populations of various species, especially snakes, lizards, frogs, and toads (Woods, et. al. 2004). Long-term effects include the lack of material on the ground to eliminate erosion and a resultant decrease in suitable habitat for forage, and cover. Blowing fugitive dust across landscapes can coat the leaves of established plants, causing loss of transpiration.

Parker 400 Race Course

The OHV event on the Parker 400 course during the desert tortoise inactivity time has the least amount of impacts to wildlife in the area. The two races increase the amount of disturbance to vegetation and wildlife. Continued monitoring of the Parker 400 event is important for decreasing the direct and indirect impacts to vegetation and wildlife. The Parker 400 directly impacts vegetation and wildlife by increasing the opportunities to trample and/or denude areas of vegetation, thereby reducing the amount of forage, cover, and breeding habitat available for wildlife. Indirect impacts to wildlife include the segmentation of habitat and barriers to wildlife movement. Short-term impacts include direct impacts to wildlife due to the noise and traffic caused by the event. Long-term impacts would affect vegetation and wildlife habitat due to increased ground disturbance and a resulting increased potential for propagation of invasive species. Wildlife would also be impacted by human use, including higher noise levels, litter, and increased human harassment of wildlife species. Impacts to desert tortoise habitat quality and quantity have been documented by return visits to previously existing tortoise burrows that are no longer inhabited within 0.5 mile of the course.

Restricting the Parker 400 competitive events to coincide with the desert tortoise hibernation period (October 15 through March 31) only reduces roadway mortalities. The events currently do impact desert tortoises by affecting the amount and quality of forage available to the tortoise when they emerge from hibernation. Indirect effects include erosion and the blowing of fugitive dust across landscapes, coating the leaves of established plant species.

Due to the socioeconomic importance of the Parker 400 racing event, cessation of this activity would not be feasible. The Parker 400 race and course need to be extensively monitored and an ongoing trend analysis study needs to be implemented in order to truly determine the impacts on biological resources, especially the desert tortoise.

Vending

Impacts on biological resources from vending are similar to those outlined previously, for all ground/water-disturbing activities and human interactions. Management seeks to limit vending according to desired ROS class; this approach potentially benefits biological resources in areas where vending would not be permitted.

Along Lake Havasu and the Colorado River vending facilities would have direct impacts by human disturbance of physical characteristics of adjacent fish and aquatic invertebrate habitats. One of the most detrimental effects of disturbance is the removal or alteration of riparian zone vegetation. Removal of this vegetation can result in loss of fish cover and shade, which elevates surface water temperatures. Also, fish spawning habitat, such as gravel and woody cover, can be rendered unsuitable by excessive siltation and erosion, which can occur when riparian vegetation is cleared for shoreline development.

Facilities

Development of educational and recreational facilities (e.g., picnic tables with ramadas if appropriate), educational signs, and trails would directly impact some vegetation and wildlife habitat due to increased ground disturbance around these facilities. Indirect impacts would include the increased potential for propagation of invasive species due to parking areas around signs and other facilities. Wildlife would also be impacted by human use, including higher noise levels and litter. Additional impacts to desert tortoise habitat quality and quantity could occur in areas where facilities are constructed and increased visitation is promoted. Any improvements and increased visitation would directly impact vegetation and wildlife by increasing ground-disturbing activities, including construction of visitor facilities, and the likelihood of increased human harassment of wildlife species.

Standard Wash and Osborne Wash RMZs

The identification of Standard Wash and Osborne Wash for management to promote and enhance OHV recreation opportunities would directly impact vegetation and wildlife and indirectly impact biological resources as a whole. Impacts on biological resources from this OHV activity are discussed in the Transportation and Public access section of this chapter.

The Standard Wash area did not receive a comprehensive survey for vegetation and wildlife species before the area was utilized as an OHV area and became a maze of roads. A survey was needed to determine the extent of the impacts on this OHV use area and surveys should be conducted before additional impacts occur. A trend analysis study has been implemented and will need to continue until OHV activities cease on this area. The vegetation and diversity of wildlife in Standard Wash were extraordinary and currently the use of this area as wildlife habitat has decreased due to the spur road development. The current increase in impacts to vegetation and wildlife would be detrimental to any remaining wildlife within the area, especially if this wash became a permanent open use area.

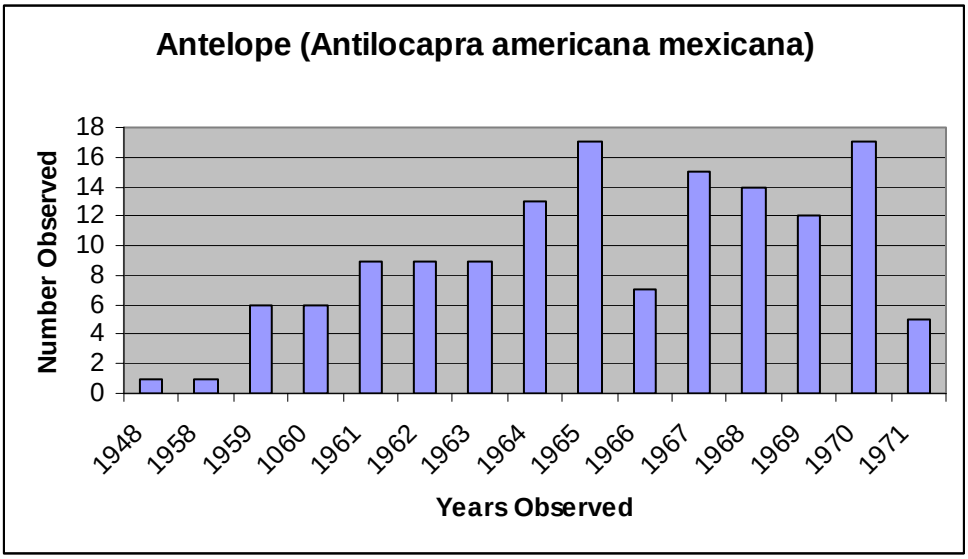
From Transportation and Public Access

Direct impacts of off-road vehicle use or cross-country travel has been well documented, and includes destruction of soil stabilizers, soil compaction, reduced rates of water infiltration, increased wind and water erosion, noise, decreased abundance of wildlife populations, and destruction of vegetation. Compaction of desert soil reduces the root growth of desert plants and makes it harder for seedlings to survive (Lovich and Bainbridge 1999).

Roads and highways pose several direct and indirect threats to tortoise populations. In fact, roads and highways are considered the greatest threat for desert tortoise. As barriers, roads inhibit dispersal and subsequent gene flow between subpopulations and meta populations. In providing access to tortoise populations, they foster such threats as development vandalism and collecting. Increased diversity and productivity of vegetation resulting from enhanced hydrological conditions beside roadways attracts tortoises, and their proximity then places them at greater risk of direct mortality from both predators and motorized vehicles. Roadkills are a substantial source of mortality not only with desert tortoise, but with other wildlife as well (Boarman, et. al. 1997).

Designation of areas and routes as open, limited, or closed to OHV use, and selection of specific networks of roads and trails in limited use areas, provides a clearly delineated travel network, reduces route proliferation, and would facilitate law enforcement. If enforceable, this designation of roads would slightly improve the conditions for wildlife. Through the route evaluation process, routes that bisect sensitive habitat and come within close proximity to bat-inhabited mines should be subject to limitations and closures for the protection of wildlife species and habitats.

Wildlife mortality can be expected as OHV use increases. Wildlife movement corridors are directly impacted by increased OHV uses. These impacts to movement corridors could potentially alter behavior, including breeding activities of wildlife species. For example, the current usage of the Standard Wash area has created a direct impact to the desert tortoise that previously inhabited this area. Therefore, it is evident that OHV usage does impact desert tortoises and affect the amount and quality of forage available to the tortoise when they emerge from hibernation. Species diversification has decreased within the entire area. Desert tortoise and antelope were present in the Standard Wash and the surrounding area in the 1960s (Beaudry 1970). When the Lake Havasu London Bridge and SR 95 were completed the antelope was extirpated from the area (see chart below).



Considering wildlife values when providing motorized and non-motorized access across public lands (with emphasis on development of non-motorized trails and trailheads) could result in fewer impacts on vegetation and wildlife habitat. Where trails and routes are selected for access, increased ground disturbance would be expect with a resulting increased potential for propagation of invasive species. Wildlife would also be impacted by human use, including higher noise levels and litter. Additional impacts to desert tortoise habitat quality and quantity could occur in areas of increased visitation. Any increased visitation would directly impact vegetation and wildlife by increasing ground-disturbing activities, and the likelihood of increased human harassment of wildlife species.

Development of routes for a number of activities, such as mining, recreation, ROWs, wildlife waters, etc., can all have direct impacts to vegetation and wildlife. These roads provide unintended opportunities for inadvertent damage due to misuse (i.e., unauthorized/administrative use). Examples include camping, rockhounding, and similar activities. In the long term, these access roads are generally associated with expansion of the route networks.

Washes (often used as travel routes) contain the most important habitat for all amphibians, reptiles, migratory birds and the Mojave Desert tortoise, especially, during drought conditions. Allowing travel in navigable washes would have direct and indirect impacts to plants and wildlife (Woods, et al 2004).

Allowing motorized vehicles to pull off the road within 100 feet on either side of the centerline on designated existing routes for safe vehicle passage, emergency stopping, and parking or disbursed camping would have direct and indirect impacts to vegetation and wildlife as outlined previously.

Table 4-4 shows the number of OHV trail miles through Wildlife Habitat Areas (WHAs), riparian and desert tortoise habitat with the opportunity to impact biological resources.

Table 4-4. Miles of OHV Trails through WHAs, Riparian, and Desert Tortoise Habitat

Allotment	Miles of OHV Trails
WHA	2,346
Riparian	41
Desert Tortoise	
Category 1	268
Category 2	863
Category 3	2,287
Mojave	224

Rockcrawling Activities

Rockcrawling activities usually occur in boulder areas, which are prime habitat for tortoise and such activities are recognized as one of the major threats to the Sonoran Desert tortoise. Limiting these activities to areas removed from special status species would provide some protection to the landscape and special status species habitat. Areas should be surveyed to insure that sensitive species are not present within any designated area for this activity. Also, constant monitoring for species diversification should occur within the designated areas to ensure that species are not extirpated.

Scenic Hiking Trail

Impacts to vegetation and wildlife would depend on the width, length, and amount of recreational use of the trail. Short-term impacts would include, but not be limited to, direct displacement of vegetation and wildlife species. Creation of the trail would directly impact vegetation and wildlife by trampling and removing vegetation used as cover, forage, and breeding habitat for wildlife,

and would increase opportunities for harassment of wildlife. Long-term impacts would depend on how many times the trail runs adjacent to the Colorado River and displaces wildlife from that source of water. Of special concern is use of the trail during the lambing season when the bighorn sheep are most vulnerable.

OHV Area Designations

Keeping open the 2,602 acres of existing "open" use areas that are currently in California would continue to have impacts to the threatened Mojave Desert tortoise. Approximately 50% of the current open use area is Mojave Desert tortoise habitat and the desert tortoise burrows identified in the initial survey are no longer occupied. During the Christmas bird count, numerous migratory birds were found in areas outside of the designated OHV areas. Only one species of migratory bird (*Phainopepla*) was sited within the OHV use areas in some of the remaining vegetation. In the heavily used areas most of the vegetation is reduced and washbanks have eroded.

Designation as a "limited" use area and prohibiting cross-country OHV use could directly avoid impacts to vegetation and wildlife habitat. By eliminating cross-country travel, washbank erosion and damage to vegetation and wildlife species can be avoided. Additionally, there would be fewer opportunities for human harassment of wildlife species and less loss of habitat due to fragmentation caused by illegal spur road development. Long-term use would impact wildlife species by increased human activities over time, including higher noise levels and litter.

Designation of areas and routes as "closed" such as the Lake Havasu Aubrey Hills serves to protect biological resources from the impacts of OHV activities; any change in these designations allowing OHV access will subject these areas and routes to the impacts outlined above.

From Biological Resources Management

The biological resources alternatives are created to provide protection for vegetation, wildlife, and fishery habitat and to control invasive and noxious species. Failure to establish WHAs would have direct impacts on all biological resources. Direct impacts could include the extirpation of several species that require protection of their habitats for their continued existence. For example the desert tortoise is sensitive to vehicular traffic and soil disturbance (Boarman, et. al. 1997). Also, failure to restrict boaters would have a direct effect on riparian marshland habitat and those vegetative enhancements currently in place.

Any facilities could directly impact wildlife species, including special status species that are not protected by the WHA designation. WHA designation does not include the entire special status species habitat (e.g., Sonoran Desert tortoise Category III is not included within the WHA designation). Throughout the alternatives, preference is given to other program needs in areas of Category III

Sonoran desert tortoise habitat. As a result, the Sonoran populations may decline in these areas. Additionally, this approach may have further reaching implications for populations in Category I and II habitat, since it is not currently known what needs the Category III habitat provides for viable desert tortoise populations.

Maintaining the natural existing quality and quantity of vegetation within a wash to the extent possible where there is an established bat species colony would provide the amount of vegetation necessary for survival. Survival rates depend on availability of undisturbed vegetation in sufficient quantity to sustain viable populations. Maintaining the wash vegetation also improves biodiversity of other species, especially migratory birds. Populations may not survive in areas denuded of vegetation (Lovich and Bainbridge 1999).

A 300-foot no-wake zone, would have direct advantageous effects if respected and enforced. A no-wake zone would encourage shoreline stability and development of emergent aquatic and shoreline vegetation. Shoreline and emergent vegetation provides shade and cover for fish, waterfowl, shoreline birds and small mammals. The organic matter created from the vegetation is a food source for benthic macro invertebrates, and stabilizes the shoreline to prevent erosion. Shoreline vegetation and vegetation on back-lying land provide a riparian zone that functions to filter pollutants from surface runoff while stabilizing erodible soils. Water birds and mammals need shoreline vegetation and shoreline protection to feed, nest, and rest.

Direct impacts associated with wildlife waters are limited to removal of old tanks associated pipes and guzzlers. This is a short-term effect, which continues until the project is completed. Generally, these projects take approximately 1 week to complete. Within that period site-specific impacts to vegetation and the displacement of wildlife would be expected due to personnel driving on dirt roads, camping, helicopter travel, and the removal of old materials. Conservation, enhancement, and restoration of wildlife habitats and source waters is vital to promoting species diversity, invasive species suppression, and an improvement in forage and cover available to wildlife.

Weed control efforts involving vegetation removal create direct effects in the absence of immediate remediation by creating opportunities for re-colonization by invasive plants and by denuding affected areas of fish cover and shade. Fish spawning habitat such as gravel and submerged woody cover can be rendered unsuitable by excessive siltation and erosion, which can occur when riparian vegetation is removed. Loss or fragmentation of plant cover along shore not only robs birds of food and shelter but also squeezes them onto a few small sites, increasing their vulnerability to predation.

Work necessary to riparian areas would have direct effects when prescribed fire is in use or during mechanical treatment of vegetation. Short-term, localized episodes of smoke and reduced visibility would result. Use of heavy equipment and the mechanical thinning of trees may also generate emissions of criteria pollutants and fugitive dust. Dust blowing across landscapes coats the leaves of established species and can eventually cause mortality in some vegetation

species. This short-term potential effect from fugitive dust continues until the plants are established. Generally, within a month of planting the plants are tall enough to improve habitat quality for most wildlife species. Indirect effects include temporary displacement of wildlife species. Vegetation treatments are expected to increase the density and quality of the riparian plant communities while also improving the quality of wildlife habitat. The use of native plant species when restoring or rehabilitating disturbed or degraded areas would result in reestablishment of native plant communities. This outcome should improve forage for both wildlife species and grazing livestock.

Continued management to control noxious species should reduce competition with native species for limited desert resources. Direct effects would be limited to periods when mechanical means are used to remove salt cedar and other invasive/noxious species and to remove sand from water catchments or to otherwise improve these waters. This is a short-term effect that would displace vegetation and wildlife but would persist only until the project is completed within a week. Long-term effects would improve growth of native plant species and thus provide additional sources of food, water, and shelter, thereby improving wildlife habitat. Ensuring the legal availability of water and maintaining adequate flows in seeps and springs would favorably impact aquatic and native plant species and associated wildlife species.

Allowing sheep and goat grazing on public lands could possibly control the continuous spread of invasive species throughout the Desert Southwest. For example, using sheep and goats to control the exotic *Brassica tournefortii*, (Sahara mustard, African mustard) an aggressive nonnative plant, would improve the possibility of native flora returning to those impacted areas that were once carpeted with native flora. Decreasing cattle densities within the current bighorn sheep habitat and limiting sheep and goat grazing to within 9 miles of bighorn sheep habitat would minimize the interchange of parasites spreading dangerous diseases to the bighorn sheep within the area.

Implementation and maintenance of structural fish habitat improvements in Lake Havasu would have a direct effect on sustaining diverse fish populations and would improve fish productivity by providing permanent escape cover and rearing habitat for young across 880 acres of currently sustained and supported habitat areas.

The ongoing addition of natural brush to the lake bottom provides an increase in the structural complexity of physical habitat that is no longer present in the reservoir. Historically, woody debris and brush was a natural component of the Colorado River. Dams stopped the floods that naturally delivered this woody material. Adding new woody debris is essential to maintaining prey density and refuge sites. Brush presents nutrients and surface area for the attachment of microscopic plants and micro invertebrates. This activity has a direct effect by creating biological habitat. Fish use of new brush piles increases as algae and invertebrates colonize the debris; usage declines as the debris decays, is overgrazed by fish, or becomes buried in sediment.

The direct effects from future enhancement of fisheries would further enhance sport fish resources by increasing the coverage of structurally complex physical habitat. Similar to brush, existing synthetic structures that are not biodegradable would be maintained in place on the lake bottom in designated locations. As brush does, synthetic structures also offer surface area for the attachment of microscopic plants. This process creates biological habitat that supplies food and refuge to the fish population. Fish use of new habitat increases as algae and invertebrates colonize the structure; usage declines as brush decays, is overgrazed by fishes, or becomes buried in sediment. Increasing the amount of physical habitat could positively influence native fish populations by creating a diversity of available refuges.

Allowing OHV routes though woodlands and mesquite bosques and the collection of wood would cause additional biological damage to vegetation causing "edges" within these areas. Edges cause increased predation on migratory species, especially the Southwestern willow flycatcher. Direct and indirect effects can occur due to the wood collection process. Failure to maintain soil stability in watersheds would increase erosion and sedimentation into the waters of the Colorado River. Increases in erosion and sedimentation deteriorate water quality and aquatic habitat, causing a negative effect to aquatic species.

Allowing motorized vehicles within desert bighorn sheep lambing grounds would have direct impacts on the ewes. Indirectly the populations of this species could decrease to a non-viable population. Such has been the outcome in Little Harquahala lambing grounds, where vehicles continue to enter the area during the seasonal closure. Closing routes seasonally may be insufficient to protect species from adverse impact or to insure their survival. Species diversification has decreased within the entire area. Desert tortoise and antelope were present in the Standard Wash area in the 1970s (Beaudry 1970) and are currently extirpated from the area. See chart above.

Wood collection includes persons driving to the site and removing dead and down material. Material removed from the ground can be considered a short-term effect causing a decrease in shelter for various species especially the amphibians and reptiles within an area (Woods, et al. 2004). Long-term effects include the lack of material on the ground to eliminate erosion and a decrease in suitable habitat for forage and cover. Excluding motorized vehicle use in the interest of protecting all woodlands, including mesquite bosques, would have a direct effect on special status species by providing refuge and opportunities for foraging removed from other stressors.

From Fire Management

Direct effects are limited to periods when the use of prescribed fire and mechanical treatment of vegetation would result in short-term, localized episodes of smoke and reduced visibility. Use of heavy equipment and the mechanical thinning of trees may also generate emissions of criteria pollutants and fugitive dust. Blowing dust across landscapes coating the leaves of established species

can eventually cause mortality in some vegetation species. This short-term potential fugitive dust effect continues until the plants are established. Generally, within a month the plants are tall enough to improve habitat quality for most wildlife species. Indirect effects include temporary displacement of wildlife species. Vegetation treatments are expected to increase the density and quality of the riparian plant communities while also improving the quality of wildlife habitat. The use of native plant species when restoring or rehabilitating disturbed or degraded areas would result in reestablishment of native plant communities. This should improve forage for both wildlife species and grazing livestock. Continued management to control noxious species should reduce competition with native species for limited desert resources.

Allowing natural fire starts to burn when conditions are appropriate would impact vegetation by allowing the natural fire cycle to occur in fire adapted plant communities. The overall result would improve forage and reduce hazardous fires that would have the possibility of killing wildlife species. These fires would create a natural mosaic of vegetation in different successional stages and would reduce hazardous fuel levels.

Full suppression of all fires would have the same impacts to fire-adapted community (chaparral) as those identified above.

The use of prescribed burns, particularly in the Harcuvar Mountains, would remove old woody vegetation and promote the growth of healthy new vegetation for forage. Prescribed burns would also aid in the control or potential elimination of invasive species.

Full suppression of fires in Mohave and Sonoran desertscrub habitat would impact vegetation and wildlife by directly decreasing mortality to plant and animal species not adapted to fire.

From Visual Resource Management

Special status species within an area are not distributed according to specific Visual Resource Management (VRM) classes. Class I areas may provide the most protection because disturbances would have to be very limited. Class II would be somewhat less restrictive, but still may have an overall benefit to the biological environment. Class III allows for more development and potentially more damage to the habitat and Class IV allows for the most development, a condition that could have the worst impact on habitat (see Table 4-5). Most of the Class IV habitat near Bullhead City is important desert tortoise habitat. Some of these lands would be the most sensitive to development when special status species are considered.

Table 4-5. Acres of WHAs within VRM Class III and IV

VRM CLASS	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
III	163,058 22%	128,530 17%	406,617 55%	331,097 44%	318,987 43%
IV	276,099 37%	104,384 14%	124,529 16%	120,111 16%	117,272 16%

From Wild Horse and Burro Management

Maintaining viable burro populations within the Herd Management Areas (HMAs) while maintaining a thriving natural ecological balance would have direct impacts to vegetation and wildlife habitat. The most important issue is to keep improving the forage for other wildlife species and maintaining viable riparian habitat. Short-term impacts would be protection of forage resources for wildlife, to include direct impacts to wildlife due to improved forage and renewed growth for trees resulting from the decrease in bark stripping by burros. Long-term impacts would be noticeable by the increase in the health of vegetation and wildlife habitat and through a diversification of plant and animal species.

Management of wild burro populations would have direct effects on vegetation and wildlife by providing protection for threatened and endangered species, riparian areas, and other wildlife habitats. Short-term impacts would include increasing growth of riparian areas providing additional nesting areas for the Southwestern willow flycatcher and other neotropical migratory birds requiring riparian habitat. Long-term impacts would be noticeable by the increase in the health of vegetation and wildlife habitat and through a diversification of wildlife species.

The creation of accessible underpasses by the Arizona Department of Transportation on SR 95 during reconstruction activities would be favorable to the bighorn sheep population in the area. Access would be provided for wild burros and wildlife to cross under the road.

From Special Area Designations

Areas of Critical Environmental Concern

Limitations on vehicular travel, mining, and camping within the Areas of Environmental Concern (ACEC) would reduce disturbance to vegetation and wildlife species by decreasing ground disturbance generally caused by OHV

utilization of federal lands. Prohibiting OHVs from creating new roads would result in reduced erosion and impacts to wildlife within the ACECs. This outcome directly impacts all sensitive species and their habitats by providing them a safe haven from future development. Not only are bighorn sheep lambing grounds protected, but nesting raptors are also directly affected by a reduction in the potential for human harassment during the nesting season. Added benefits derive from protection against disturbance of adjacent foraging areas. Decreasing the size of all of the ACECs or not designating them would have direct impacts to vegetation and wildlife by reducing the protection afforded to these areas.

The Three Rivers Riparian ACEC designation protects pristine riparian habitat and bald eagle nests. Limitations on vehicular traffic would reduce disturbance to vegetation and wildlife species by decreasing ground disturbance generally caused by OHV utilization of federal lands. There are a few old and new vehicle routes in this ACEC and one is within a bald eagle nest zone. Discontinuing the protection afforded the bald eagle nests within the Three Rivers Riparian ACEC would directly and indirectly affect the species by eliminating the protection afforded under the original designation.

Designation development of interpretive signs and other facilities within the Swansea ACEC would have direct impacts to the remaining vegetation and wildlife habitat due to increased ground disturbance. Indirect impacts would include increased potential for propagation of invasive species. Wildlife would also be impacted by human use, including higher noise levels, litter, and the likelihood of increased human harassment. Additional impacts to desert tortoise habitat quality and quantity could occur in areas of increased visitation. Increase in visitation would directly affect the bat population by disturbing the bats within the associated mines at the Swansea Townsite.

Consideration of the Aubrey Hills ACEC would provide protection for those special status species and their habitats within this region. The shoreline constitutes critical habitat for ESA species and is vital to their continued survival. Decreasing the size of the Aubrey Hills designation would affect this important conservation area and its associated vegetation and wildlife habitat found within the area by eliminating buffer zones for the protection of these species. Without the ACEC designation of this area those priority species would suffer and the biological resources of this region would be degraded. Allowing a major access to Lake Havasu through this area would decrease forage for bighorn sheep and decrease protection for unique vegetative communities by increasing vehicular access, especially during the lambing season. The creation of new vehicle routes would increase impacts to wildlife due to habitat fragmentation.

The Crossman Peak ACEC provides protection to the biological resources of the area; however, across the alternatives the acreage of this designation changes. Of special concern is the historic Bat Cave, which is excluded under the alternatives with smaller acreages. This cave is a roost site for 14 species of bats throughout the season and should be protected under the Federal Cave Protection Act of 1988. It was historically mined for the guano in the 1930s.

The Bullhead Bajada is important Category II desert tortoise habitat and protection is warranted since the species within this area has been genetically linked to the Mojave Desert tortoise subspecies. Future genetic studies are being proposed within the area to determine the percentage of individual desert tortoises that are genetically linked to the Mojave subspecies. It is important to protect this desert tortoise habitat.

Whipple Wash contains important lek sites for bat species and numerous abandoned mine lands that need protection from OHV activities. Species diversity within the washes, especially diversity of bats and migratory birds, would suffer directs impacts from the failure to protect this area.

The Beale Slough is important riparian habitat for migratory bird species and other special status species. The site has received extensive habitat improvements from various agencies and protection is needed to maintain the re-vegetation projects.

Back Country Byways

If previously disturbed locations are not utilized for the development of interpretive signs and other facilities, some direct impacts to vegetation and wildlife habitat due to increased ground disturbance would occur. All locations where vehicles would stop should be placed outside of the wildlife movement corridors. Direct impacts to movement corridors could potentially alter behavior, including breeding activities of wildlife species. Indirect impacts may result in increased potential for propagation of invasive species. Wildlife would also be impacted by human use, including higher noise levels and litter near the signs and facilities.

Any increased visitation would directly impact vegetation and wildlife by increasing ground-disturbing activities and the likelihood of increased human harassment of wildlife species. Increase in visitation would directly affect the bat population in the associated mines within the proposed Back Country Byways especially within the Bouse/Parker/Swansea and Cienega proposed byways. Any increase in recreational use of the area would indirectly increase ground disturbance associated with vehicular use and periodic maintenance. Wildlife mortality can be expected as vehicular use increases. Additional impacts to desert tortoise habitat quality and quantity could occur in areas of increased visitation. Desert tortoise populations are depleted within at least 0.5 mile of highway edges and may be affected as far away as 2 miles for highways. Distance and intensity of the desert tortoise population depletion may increase with level of traffic and age of the road (Boarman, et. al. 1997). Wildlife movement corridors are directly impacted by increased vehicular uses. The proposed Plomosa Back Country Byway states rock-hounding as one of the important issues for this byway. Rockhounding should be limited within the Category II desert tortoise habitat, which this road currently bisects. The Sonoran Desert tortoise utilizes these rocks and rocky outcrops as shelter sites.

Impacts from continued rockhounding activities would affect this large population of desert tortoise.

Wilderness Areas

Continuation of the management actions associated with the currently designated Wilderness Areas would directly impact vegetation and wildlife habitat by continuing to restrict OHV use of these areas. Limiting the possibility of constructing new permanent water catchments could directly affect all wildlife within the area. New permanent water catchments may be required to provide additional water sources in certain areas to direct wildlife away from populated and recreational areas. Studies of wildlife water developments in southwestern Arizona have shown that they are important for maintaining viable populations of invertebrates and vertebrates (Rosenstock, et. al. 2004). The Arizona Game and Fish Department began constructing artificial water developments in 1946 before the wilderness designations. Initially designed to benefit game bird populations, water developments have been used to increased wildlife populations in areas where water is a limiting factor, to mitigate loss of natural water sources, and to enhance amphibian populations (Arizona Desert Bighorn Sheep Society 2004).

Wilderness/Wilderness Study Area

Limiting the possibility of constructing new permanent water catchments could directly affect all wildlife within the area. New permanent water catchments may be required to provide additional water sources in certain areas to direct wildlife away from populated and recreational areas. Studies of wildlife water developments in the southwestern Arizona have shown that they are important for maintaining viable populations of invertebrates and vertebrates (Rosenstock, et. al. 2004).

Protecting the area's existing unique plant species composition and stabilized sand dune ecosystem would have direct impacts to the conservation targets of Death Valley Mormon tea (*Ephedra funerea*) and scaly sandplant (*Pholisma arenarium*). This outcome would have indirect impacts to wildlife species in the area by providing increased wildlife forage and species diversity.

Wild and Scenic River Designations

Within the eligible Wild and Scenic portions of the Bill Williams River, the management actions taken to ensure no adverse impacts to values that define suitability for designation would indirectly impact vegetation and wildlife habitat if livestock are removed from the area, thereby decreasing competition for forage. OHV river crossings would also be eliminated, resulting in reduced streambank erosion, impacts to riparian vegetation, impacts to wildlife habitats, and degradation of water quality.

From Areas Allocated for Wilderness Characteristics

The protection of wilderness characteristics could enhance biological resources in those areas that are allocated to this type of management. Indirect impacts include special protection for vegetation and wildlife habitat within the proposed areas.

Cumulative Impacts

Growth in the LHFO area should continue into the foreseeable future. Within the planning area, 64% of lands are public; however, within the Colorado River corridor, the majority of lands are comprised of private, tribal, and Arizona State Trust properties. Growth is concentrated in the river corridor, and most growth will continue there. With the continued use and development of BLM neighboring lands, progressive impacts to fish and wildlife habit at are likely to persist as a problem in the planning area into the foreseeable future. Biological resources on public lands may be affected by off-site use and development regardless of the RMP alternative selected.

Increased boat traffic has caused significant soil erosion along the shoreline and has therefore decreased plant life along the shoreline of the waters of the Colorado River. This outcome has caused a limitation on places where migratory birds can land to find food, water, cover or space. Stress and eventual mortality has increased for species during their migration up and down the Colorado River. The effects of promoting increases in recreational usage of Lake Havasu and the Colorado River has increased boat traffic and human activity on the waters of the Colorado River causing impacts to the Yuma clapper rail, Southwestern willow flycatcher, other migratory birds, razorback sucker, and other species requiring access to the water.

The impacts from increased local emissions from vehicles including boats are well documented on humans. The overall impacts to wildlife species—especially endangered species—is unknown. Excessive motorized travel over time causes a decrease in plant life not only from trampling but also from proliferation of dust particles. Dust that is accumulated on plants can cause transpiration failure and eventual death of the plants (Lovich and Bainbridge 1999).

Direct impacts of off-road vehicle use or cross-country travel has been well documented, and includes destruction of soil stabilizers, soil compaction, reduced rates of water infiltration, increased wind and water erosion, noise, decrease abundance of wildlife populations, and destruction of vegetation. Compaction of desert soil reduces the root growth of desert plants and makes it harder for seedlings to survive. Effects to soils, over time, cause erosion of soils, loss of topsoil, and compaction of soils. These impacts bring changes in the types of vegetation that can be sustained within these landscapes. Vegetation changes on the landscape scale over time change the diversity of the wildlife utilizing the area. Watershed conditions are also impacted by eroding soils, which then affects water quality and the fish populations within those affected waters

(Lovich and Bainbridge 1999). OHV traffic impacts desert tortoises and affects the amount and quality of forage available to the tortoises when they emerge from hibernation.

OHV traffic impacts desert tortoises and affects the amount and quality of forage available to the tortoises when they emerge from hibernation. Roads and highways pose several direct and indirect threats to tortoise populations. In fact, roads and highways are considered the greatest cumulative threat for desert tortoise. As barriers, roads inhibit dispersal and subsequent gene flow between subpopulations and meta populations. In providing access to tortoise populations, they foster such threats as development, vandalism, and collecting. Increased diversity and productivity of vegetation resulting from enhanced hydrological conditions beside roadways attracts tortoises and thereby places them at a greater risk of direct mortality from both predators and motorized vehicles. Roadkills are substantial source of mortality not only with desert tortoise, but with other wildlife as well (Boarman, et. al. 1997).

Overgrazing causes cumulative impacts to vegetation and wildlife, causing increased degradation of wildlife habitats.

Racing events have caused cumulative disturbances to vegetation and wildlife within more than 1 mile of their influence. For example the Parker 400 events have extirpated the desert tortoise from the original burrows that were identified and surveyed over time (Bates 2005). The Parker 400 directly impacts vegetation and wildlife by increasing the opportunities to trample and/or denude areas of vegetation, thereby reducing the amount of forage, cover, and breeding habitat available for wildlife. Negative impacts to vegetation and wildlife habitat increase within high traffic areas. Increased use of Osborne Wash has affected wildlife movements along this once important wildlife corridor.

Each new lakeshore structure adds to the cumulative effects of neighboring structures. Their overall impacts, if not monitored, could adversely affect special status species. The cumulative effects from any expansion of leases may contribute to degradation of water quality, creating impacts on sport and native fish resources along with disturbance within waters of the Colorado River. The cumulative loss of shoreline vegetation would also have negative impacts on migratory and resident birds, especially the Yuma clapper rail and the Southwestern willow flycatcher through loss of habitat.

Developed shoreline recreation sites, especially new boat ramps, can constitute a direct loss of wildlife, aquatic, and riparian habitat. Additional facilities on the lake add to the boating pressure, and impacts are not limited to the immediate vicinity of the facility. Seawalls subtract from wildlife and aquatic habitat. Such habitat loss becomes critical when lakeshore vegetation is scarce. Impacts include increased hydrocarbon pollution from boats, spillage, shoreline disturbance from wave activity, trampling, and beaching of boats. The presence of humans, their activities, and noise reduce the value of aquatic vegetation to fish, shorebirds, waterfowl, and wildlife. Increased dispersed camping and/or day use along the shoreline causes loss of such vegetation as cattails and bulrushes, which could also affect the two endangered fish (razorback sucker and

bonytail chub) as well as shorebirds (including the Yuma clapper rail) and waterfowl. Recreational boat traffic near shore areas is particularly detrimental to spawning sites and rearing cover, and could be critical to native fish due to disturbance, noise, and siltation from prop wash.

Impacts on Fire Management

No impacts to fire management are expected from Paleontological Resources, Special Area Designations, Visual Resource Management, and Wilderness Characteristics

Management objectives include meeting air quality standards. Meeting air quality standards limits the amount of prescribed burning in the planning area. Every prescribed fire requires an approved prescribed burn plan that lists predetermined prescription criteria for weather and fuel conditions. The plan also includes smoke management criteria, which are important to determining the complexity of the prescribed fire. These criteria define measures that would be taken to reduce smoke impacts on sensitive receptors from prescribed fire. ADEQ or the Mohave Desert Air Quality District must approve all prescribed fires before being implemented. State air quality regulations enforced by ADEQ and Mohave Desert Air Quality District meet or exceed federal standards.

Implementing prescribed fire in fire-adapted environments and fuel treatments in other high-risk locations would improve watershed conditions, increase soil cover, and promote proper water flows.

No impacts to Fire Management have been identified as a result of Paleontological Resources, Special Area Designations, Wilderness Characteristics, Wild Horse and Burro Management and Visual Resource Management.

From Cultural Resources

Protecting cultural resources results in fire managers using Minimum Impact Suppression Tactics (MIST) during suppression that might affect cultural resources. When implementing MIST, fire managers use the fewest fire suppression resources, and least-impacting tools and equipment to effectively manage and suppress fire, while (1) meeting fire management protection and resource objectives and (2) minimizing the impact to cultural resources and the landscape. Examples of MIST used by fire managers include the following:

- limiting fire vehicles to established road rights-of-way;
- burning out from existing roads, trails, and natural breaks; and
- placing fire lines and retardant lines away from known cultural sites.

MIST applies indirect attack strategies more often than direct attack strategies. Where areas are not surveyed, cultural sites could be unintentionally damaged, especially flammable structures. Mitigation measures taken by fire managers to protect cultural sites in suppression and prescribed fire would reduce the known and unknown impacts to cultural resources. The expected results include more area burned by wildfires and increased suppression costs.

In prescribed fires, protecting cultural resources results in the following measures:

- relocating planned firelines,
- adjusting the size of burnblocks,
- mitigating adverse effects by removing vegetation around cultural sites to protect them, and
- determining where prescribed fires might or might not be planned from known cultural resources.

Such measures would have the following results:

- increasing project costs to protect cultural sites,
- spending more time and cost in planning, and
- excluding some areas from burning because of the presence of cultural resources

From Rangeland Management/Grazing

Current grazing practices affect fire management in many ways. Improvements designed for managing livestock, such as water facilities, fences, corrals, and other structures, present a risk of property loss in the event of a wildfire, as well as potential hazards to fire fighters and fire operations.

Removal of forage by livestock, especially removal of light fuels in the form of grasses and forbs, can reduce the potential of a site to carry fire and result in fewer fires of lower intensity or lower rates of spread. A history of grazing, especially improper grazing, can convert ecological types. Conversion of grasslands or ecological types with naturally high grass components to types with higher woody species can result in lower fire frequencies but higher fire intensities when these converted types do burn. In these cases, wildfires might not burn as often, but the likelihood of a catastrophic fire increases.

Livestock grazing in the Sonoran and other western desert ecosystems has led to rapid invasion of Mediterranean annual grasses and forbs, most notably red brome (*Bromus rubens*) and downy brome (*Bromus tectorum*), which have increased the fire frequency in ecosystems where the natural vegetation is not fire-adapted. The potential outcome of this invasion is the possibility of creating

a fire-dependent plant community consisting mainly of nonnative invasive annual plants, and the eventual loss of native desert vegetation in those places

Woody species have encroached on the natural desert grasslands, reducing natural fire frequency and reducing light fuels to carry natural fires. As a consequence, a prescribed burning program has been developed to reduce woody species and encourage recovery of natural grasses. Many factors affect the success of the prescribed fire program, not the least of which is the assurance of adequate amounts of fuel to carry a fire. Livestock grazing in areas planned for burning can remove enough fuel to reduce or eliminate the opportunity to successfully burn. Rest from livestock of a season or more in those same pastures can also increase the opportunity for natural fire starts from lightning or from unplanned human ignition.

In Sonoran desert vegetation communities, prescribed burning is confined to the fire-adapted Arizona Interior Chaparral vegetation communities, Harcuvar, and Mohave Mountains. Livestock grazing in those areas would have little effect on prescribed or wildland fire operations. In desertscrub and other desert communities, wildfires depend on large volumes of ephemeral annual grass and forb production, generally after winters with above-average precipitation. Livestock operators commonly apply for increased livestock numbers to take advantage of abundant forage. In years where the amount of ephemeral production is marginal, high livestock numbers can reduce the potential of large fires. In years with extraordinary ephemeral production (perhaps 1 year in 10), livestock would not affect fire potential

From Lands and Reality

Continued use of the existing utility ROWs is expected to temporarily affect fuels and fire because of ground disturbance and increased opportunities for ignition during operation and maintenance.

Building more utilities, transportation corridors, and communications sites would affect fire by increasing opportunities for accidental human-caused ignition. More improvements and structures would do the following:

- affect suppression and costs by placing on the ground more features that could require protection from a wildfire;
- present more hazards, such as flight hazards from overhead power lines or explosion hazards of buried gas pipelines; and
- create restrictions to prescribed burning.

Impacts from disposal of as much as 83,475 acres of federal land could include redistributing the overall federal land ownership and consolidating federal lands into more contiguous management blocks. This disposal could reduce fire suppression and management responsibilities and increase their effectiveness. Suppression costs could decrease. Management would be more contiguous

across the landscape (not broken by parcels of non-BLM ownership) with a resultant increase in the efficiency of operations.

Depending on post-disposal land use, all alternatives could affect both fire suppression and fuels conditions. Continued wildland uses and management would probably have negligible impacts. But conversion to development uses would increase human populations and change ignition potential, fire behavior, and risk decisions.

Historically, maintaining and building new utility projects have had minor impacts to the Fire Management Program. Impacts to vegetation and increases in fine fuels due to ground disturbance would be minimal and short term. Increased opportunities for ignition during operation and maintenance are expected to have negligible effects.

The Land Tenure adjustment proposal might affect fire management, depending on the post-disposal land use conversion. If disposal leads to development, human population in the area and visitor use on adjacent public lands could increase. This increase could increase the potential for accidental human-caused fire starts. Developing these parcels would also do the following:

- expand the Wildlife Urban Interface,
- potentially increase fire suppression complexity and costs, and
- increase the risk of public loss of life or property in the event of a wildfire.

From Minerals Management

The LHFO planning area allows new mineral entry as well as existing mineral rights. The result is an increase in human activity and in the probability of human-caused fire ignitions.

From Recreation Management

In the planning area confining vehicles to designated routes would reduce the potential for accidental human-caused ignitions. This restriction is especially important in grassland fuel types. Allowing dispersed camping with few limitations could affect fire management by increasing the risk of accidental human-caused ignitions. Allowing target shooting anywhere would increase the potential for accidental human-caused ignitions. Shooting is a common cause of wildfire in some areas of LHFO.

From Transportation and Public Access

Road closures would affect fire management by reducing access to fires by ground initial attack resources (i.e., on-the-ground personnel and equipment). This reduction would have the following impacts:

- increased initial attack response time,
- limited access to fires,
- fewer roads to use as firelines,
- larger fires (more acres burned), and
- increased fire suppression costs.

Reducing the number of roads would decrease the roads that could be used as firelines for prescribed burning. This reduction might result in the need to build more firelines to safely implement prescribed fires and therefore increase the cost of prescribed burning.

From Biological Resources

The impacts of biological resource management on fire suppression would consist of restrictions imposed on suppression strategies to protect priority habitat and species from disturbance from heavy equipment. Examples of these restrictions would be (1) prohibiting heavy equipment such as dozers in building firelines and (2) restricting fire vehicles to existing roads.

In the planning area sensitive and threatened and endangered species might limit actions on fuel treatments, such as what vegetation type can be treated in specific areas or at specific times. Seasonal restrictions to protect sensitive and threatened and endangered species affect fire management by not allowing for prescribed burning or mechanical treatments during certain times of the year.

Cumulative Impacts

As population growth occurs and communities grow there is an ever-increasing risk of accidental fires to be started throughout the field office boundaries.

Impacts on Cultural Resources

Impacts to cultural resources can be characterized as those allocations or actions that result in loss, degradation, or destruction of National Register of Historic Places (NRHP)-listed or eligible cultural properties (sites or districts), traditional cultural properties, or cultural landscapes. Avoidance is the preferred method to

prevent loss, but other mitigation can reduce and resolve adverse effects to significant properties.

Data used to develop this analysis were consolidated from cultural survey and site maps (atlas), Site Steward monitoring data, Arizona and California State Historic Preservation Officers, National Park Service bulletins, the AZSITE cultural resource inventory database, California Historic Resources Inventory System, and San Bernardino County Archaeological Information Center, lifeways information from Native Americans and ethnographic reports, the Arizona Land Health Standards, and various published data.

No impacts to cultural resources have been identified as a result of Paleontological or Visual Resource Management.

From Cultural Resource Management

Allocation to the "Public Use" category would lead to increased visitation and thereby increase the potential for damage to existing cultural sites from depreciative behavior. On the other hand, increased visitation may act as a deterrent to major vandalism by increasing public surveillance of sites and making the public more aware of cultural resource values. The number of sites allocated to this management category varies among the alternatives.

Alternative 1 would least increase visitation as only Swansea is currently allocated to the "Public Use" category. Swansea receives 3,000 to 5,000 visits per year, primarily in the cooler winter months.

Of the proposed alternatives (other than Alternative 1), Alternative 2 allocates the fewest number of sites (seven) to "Public Use" and would have the least impact due to increased site visitation.

Alternative 3 allocates the most sites (12) to "Public Use," with a concomitant increase in site visits and potential for damage to cultural resources.

Alternatives 4 and 5 (Preferred) have the potential to impact cultural resources from increased site visitation due to allocation of nine sites to "Public Use."

From Rangeland Management/Grazing

Implementation of the Arizona Guidelines for Grazing Administration will limit the impacts to cultural resources. Some residual cultural resource values would be lost, after mitigation, within grazing allotments. Cattle grazing may result in displacement of surface artifacts, causing loss of site context, disturbance or destruction of features (e.g., intaglios), and similar impacts from cattle trailing or congregating. Surface artifacts can be crushed, broken, and relocated as a result of trampling by cattle; standing walls of historic and prehistoric structures can collapse or become destabilized as a result of cattle rubbing up against them;

petroglyphs and pictographs may be damaged by cattle rubbing against them; and cattle trails can accelerate site erosion.

Sites could also be damaged by soil erosion associated with the loss of stabilizing vegetation or the trampling of streambanks in riparian areas. Damage from grazing is primarily confined to areas where sensitive sites occur and livestock tend to concentrate, such as corrals, stock ponds, and other water sources. Some damage occurs within sites crossed by livestock trails. Few impacts are expected from dispersed use under all alternatives.

Alternative 1 has 17 grazing allotments, five of which are ephemeral and only subject to grazing when sufficient annual vegetation is available. The remaining 12 allotments are authorized for year-round grazing for a specific number of animals. Impacts to cultural resources that have been occurring in the past will continue. When adverse impacts are identified, appropriate mitigation is implemented, such as relocation of range improvement or construction of fencing to keep cattle away from sensitive resources. This is the same as Alternative 3.

Alternative 2 proposes closing all grazing allotments. This alternative would have the least impact on cultural resources.

Alternative 5 (Preferred) is the same as Alternative 4. The number of year-round grazing allotments would be 10 (five ephemeral), and up to two allotments would be removed following evaluation. Impacts to cultural resources are expected to be greater under this alternative than under Alternative 2, but fewer than under Alternatives 1 or 3.

From Lands and Realty Management

Land Disposal Management

Forty-five sites are recorded on 51,949 acres identified for disposal under Alternative 1 (No Action). Seventeen of these sites are located within lands identified as available for R&PP lease. Additional sites are expected to occur within the identified lands. Some of these lands contain significant sites eligible for inclusion on the NRHP. A few of the sites appear to be nationally significant. While site-specific survey, evaluation, and mitigation would be completed prior to any disposal or R&PP lease, some residual cultural resource values would be lost, after mitigation, within lands that leave federal ownership.

Twenty-two sites are recorded on 34,159 acres identified for disposal under Alternative 2. Five additional sites are located within lands identified as available for R&PP lease only. Additional sites are expected to occur within the identified lands. While site-specific survey, evaluation, and mitigation would be completed prior to any disposal or R&PP lease, some residual cultural resource values would be lost, after mitigation, within lands that leave federal ownership. There are fewer sites, and fewer significant sites, within these lands than under

the remaining alternatives. Of the four alternatives, this alternative has the least impact resulting from land disposals.

Eighty-six sites are recorded on 83,475 acres identified for disposal under Alternative 3. Seventy-three of these sites are located within lands identified as available for R&PP lease. Additional sites are expected to occur within the identified lands. Some of these lands contain significant sites eligible for inclusion on the NRHP. A few of the sites appear to be nationally significant. While site-specific survey, evaluation, and mitigation would be completed prior to any disposal or R&PP lease, some residual cultural resource values would be lost, after mitigation, within lands that leave federal ownership. Of all the alternatives, this alternative has the greatest impact resulting from land disposals.

Forty-five sites are recorded on 56,715 acres identified for disposal under the Preferred Alternative and Alternative 4. Twenty-nine of these sites are located within lands identified as available for R&PP lease. Additional sites are expected to occur within the identified lands. While site-specific survey, evaluation, and mitigation would be completed prior to any disposal or R&PP lease, some residual cultural resource values would be lost, after mitigation, within lands that leave federal ownership. The impacts on cultural resources under these alternatives are greater than under Alternative 2 but less than under Alternatives 1 (No Action) and 3.

There would also be residual loss of cultural resource values across all the alternatives from the consumptive study of sites during mitigation because these sites would not be available for future study where more advanced study methods could be employed.

Potential Mitigation Measures

If nationally significant sites are found on parcels proposed for disposal, or if cultural resources that are eligible for inclusion on the National Register of Historic Places are identified where the loss is not amenable to mitigation measures, those parcels would not be subject to disposal.

Land Acquisition Impacts

More than 25,000 acres were identified in previous plans for acquisition. None of these acres were specifically identified for acquisition of significant cultural resources. No sites are recorded on the subject lands. This alternative will have no impacts to cultural resources.

The Alternative 5 (Preferred) and Alternatives 2, 3, and 4, include criteria for acquisition that would enhance management of significant cultural resources. They include acquisition of properties adjacent to public lands that contain significant cultural resources including, but not limited to, properties eligible for

inclusion on the NRHP. Priority acquisitions would be lands containing portions of eligible sites that extend onto adjacent public lands.

Utility Corridor Management

One hundred seventy-four sites are recorded within the existing identified corridors. Additional sites are expected to occur within the identified lands. Additional utility construction within the corridors would have the potential to impact significant cultural resources by displacing and damaging artifacts and disturbing or destroying features. Among the four alternatives, Alternative 1 would impact the fewest sites.

One hundred seventy-eight sites are recorded in the corridors proposed under Alternative 2. Additional utility construction within the corridors would have the potential to impact significant cultural resources. Due to the known presence of 14 additional sites within the new corridors, this alternative will have a slightly higher impact on cultural resources than Alternative 1 (No Action).

Two hundred ninety-three sites are recorded in the corridors proposed under Alternative 3. Additional utility construction within the corridors would have the potential to impact significant cultural resources. Due to the known presence of 14 additional sites within the new corridors, this alternative will have a much higher impact on cultural resources than Alternative 1 (No Action).

Two hundred seventy sites are recorded in the corridors proposed under Alternative 4. Additional utility construction within the corridors would have the potential to impact significant cultural resources. Due to the known presence of 14 additional sites within the new corridors, this alternative will have a much higher impact on cultural resources than Alternative 1 (No Action).

Two hundred forty-one sites are recorded in the corridors proposed under Alternative 5 (Preferred). Additional utility construction within the corridors would have the potential to impact significant cultural resources by displacing and damaging artifacts, and disturbing or destroying features. Due to the known presence of 14 additional sites within the new corridors, this alternative will have a much higher impact on cultural resources than Alternative 1 (No Action) and slightly less than Alternatives 2, 3, and 4.

Communication Site Management

A designated communication site is located on Black Peak on lands identified as important to the Colorado River Indian Tribes. The towers have negatively impacted a location identified as important to the tribe for religious and traditional purposes.

Under Alternatives 2, 3, 4, and 5 (Preferred) the communication site at Black Peak would be undesignated and the facilities would be moved to another location when practicable.

From Minerals Management

Any surface-disturbing activities related to minerals actions have the potential to impact cultural resources. All authorized mineral-related activities, beyond casual use, generally require a survey to determine if cultural resources are present. Some cultural resources may be buried and mineral-related activities may expose and cause inadvertent damage to these resources. In all cases, impacts to significant cultural resources are mitigated.

Archaeological surveys are completed to identify and evaluate any cultural resources that could be affected by a proposed mining operation. BLM has discretion to deny approval of proposed mineral material sales that would damage cultural resources. Approved mining plans contain provisions to avoid or mitigate damage to cultural resources, if such resources would be affected. Since it is often difficult to implement avoidance, scientific data recovery is typically implemented as a mitigation measure.

Mining and exploration activities defined as casual use, and exploration activities disturbing less than 5 acres typically do not require mining plans. It is more difficult to monitor and mitigate the effects of these activities on cultural resources or the effects of associated activities such as camping.

With regard to locatable minerals, five to 10 new mining operations are expected to be developed over the life of this RMP and one large operation is anticipated. The total estimated disturbance related to new mining exploration and operations over the life of the RMP is 1,000 acres. Mining locations and access routes are generally surveyed prior to ground-disturbing activities and identified sites eligible for inclusion on the NRHP are avoided or adverse impacts are mitigated on a case-by-case basis. Negative impacts due to mining exploration and extraction activities are expected to be the same for all alternatives. Acreage closed to mineral entry and concomitant protection for sites within these locations, vary by alternative.

Exploration for minerals prior to submission of a mining notice or plan, or roads constructed as part of a leasing operation, may inadvertently damage cultural resources. Mining roads constructed as part of a plan of operations may provide vehicular access to areas not previously accessible to the recreating public, providing unintended opportunities for inadvertent damage due to camping, rockhounding, and similar activities, or intentional damage due to looting or vandalism. These mining roads are generally surveyed for cultural resources prior to construction and indirect impacts associated with expansion of the route networks can be evaluated and mitigated (if necessary) on a site-specific basis.

All of the wilderness areas are closed to mineral development, except for valid existing rights. The WSA is closed to Salable and leasable minerals. BOR lands are also withdrawn from mineral entry.

Salable Minerals Management

Mineral material sales have been restricted for a portion of the lands managed by LHFO. This protects important sites within the excluded areas from this kind of impact.

Alternative 1 (No Action) restricts mineral material sales from all 15 cultural sites and areas identified in the Yuma RMP, the four areas (Whipple Mountains, Aubrey Hills, Gibraltar Mountains, and Cactus Plain) managed under special prescriptions, the Bill Williams Riparian Management Area, Three Rivers ACEC riparian zones, Crossman Peak Natural Scenic Area, and lands identified in the Yuma RMP as priority wildlife habitat areas. This Alternative restricts 447,611 acres from mineral material disposal. The lack of ground disturbance associated with mineral material sales would benefit sites located in these excluded areas. While more acreage is closed to mineral material disposal than Alternative 5 (Preferred), the areas closed under this alternative contain fewer sites.

Alternatives 2 and 4 exclude mineral material disposals from the Special Cultural Resource Management Areas (SCRMAs), the Lake Havasu Special Recreation Management Area , bighorn sheep lambing grounds, all ACECs, and lands allocated to conserve wilderness characteristics. Alternative 2 restricts the largest area from mineral material sales at 542,821 acres and Alternative 4 would restrict 447,422 acres. The lack of ground disturbance associated with mineral material disposals would benefit sites located in these excluded areas. These alternatives provide the most protection for cultural resources.

Alternative 3 only excludes mineral material sales from designated Wilderness and lands withdrawn from minerals. Wilderness designation already affords protection to cultural resources from impacts related to authorized uses. This alternative restricts 240,931 acres from mineral material disposal. This alternative would least benefit cultural resources.

No new mineral material sales (or expansion of existing pits) would be allowed on cultural sites and areas allocated to “Conservation for Future Use,” “Traditional Use,” or “Public Use”; riparian areas; desert tortoise Category I habitat; Bullhead Bajada ACEC; Beale Slough ACEC; and OHV Open Areas. Alternative 5 (Preferred) restricts 299,802 acres from mineral material disposals. This alternative provides more protection for cultural resources than Alternatives 1 (No Action) and 3 but less than Alternatives 2 or 4.

Leasable Mineral Management

Closing lands to leasing protects cultural sites within the closed areas from exploration and occupancy impacts. Lands closed to leasing are limited to designated Wilderness. Closure of lands to surface occupancy provides protection for sites in the vicinity of leased lands. Protection levels vary by alternative. Well locations and access routes are generally surveyed prior to ground-disturbing activities and identified sites eligible for inclusion on the NRHP are avoided or adverse impacts are mitigated on a case-by-case basis.

Alternative 1 (No Action) allows surface occupancy for oil and gas leases except on bighorn sheep lambing grounds and lands immediately adjacent to springs in priority wildlife habitat (approximately 40 acres surrounding each spring), on riparian lands along the Bill Williams River, and on all other riparian areas covered by the former Yuma RMP, on the 15 cultural resource sites and areas referred to in the Yuma RMP, and within the Three Rivers Riparian ACEC. This alternative protects the largest number of cultural sites from impacts associated with surface occupancy related to mineral leases.

The lands allocated to conserve wilderness characteristics would have a classification of no surface occupancy applied for mineral leasing under Alternatives 2 and 4. These areas would be protected from surface disturbances related to mineral leasing activities.

For Alternatives 2, 3, 4 and 5 (Preferred), there would be a stipulation of no surface occupancy for leasable minerals on cultural sites and areas allocated to "Conservation for Future Use," "Traditional Use," or "Public Use," and to areas within 0.25 mile of the Colorado and Bill Williams Rivers and within the riparian zone of the Three Rivers ACEC. These areas would be protected from surface disturbances related to mineral leasing activities.

Locatable Mineral Management

Alternative 1 (No Action) includes withdrawal from mineral entry of 486 acres in the Three Rivers Riparian ACEC, and lands located within T 20 N, R 21 W, Sections 34 and 35, and T 19 N, R 21 W, Sections 4, 6, 8, and 28. In addition, there are private minerals in the same vicinity that would be acquired and those lands would be closed to mineral entry. The lands identified in the mineral withdrawals above contain significant cultural resources that are protected under this alternative. Alternative 1 (No Action) affords the highest level of protection to cultural resources among all alternatives due to the restriction on mining in sensitive areas. Negative impacts due to mining exploration and extraction activities are expected to be similar for all alternatives. However, this alternative has more lands withdrawn from mineral entry than the other alternatives and therefore protects more sites.

Alternatives 2, 4 and 5 (Preferred) have identified 185 acres within the Bullhead Bajada ACEC, 238 acres within the Three Rivers Riparian ACEC, and 10 acres

of Incline Railway for mineral withdrawal. These alternatives protect significant cultural resources located within the identified areas. Negative impacts due to mining activity are expected to be similar for all alternatives, but acres protected by mineral withdrawal and the sites located on them, are fewer than in Alternative 1 (No Action).

Alternative 3 provides the lowest level of protection for cultural resources and the highest potential impact to significant sites as a result of mining activity as the Swansea Townsite is the only area proposed for withdrawal.

The Swansea Townsite would be withdrawn from mineral entry under Alternatives 2, 3,4, and 5 (Preferred) and is approximately 200 acres. The area to be withdrawn includes those sites of greatest cultural importance, such as the historic buildings and foundations and the Railroad Canyon, which are eligible for listing on the NRHP.

From Recreation Management

Where long-term impacts from recreational use are observed or anticipated, activities will be controlled through specialized management actions such as designated campsites, permits, and limitations on number of users, types of use, and duration of use. This approach will provide opportunities for protection of cultural resources if long-term impacts are anticipated or identified.

The recreation management practice of providing restrooms and other facilities adequate for anticipated uses at designated campgrounds, trail heads, and other areas where recreational users congregate has the potential to impact cultural resources located where there is a concentration of recreational users. Increased use of these new facilities has the potential for indirect impacts to archaeological sites from increased visitation.

Issuing Special Recreation Permits for competitive and organized group activities near archaeological sites may increase the potential for vandalism and may also detract from the setting of the cultural landscape for visitors.

Under all alternatives, indirect impacts to archaeological sites from increased visitation-and general recreation include both intentional and inadvertent damage to archaeological resources. Impacts include, but are not limited to, surface artifact theft and breakage, artifact displacement, vandalism, and unauthorized digging for artifacts.

All alternatives allocate additional SRMAs and RMZs to enhance recreation opportunities and experiences. There is a potential for adverse impacts to significant cultural resources as a result of these designations and subsequent management for them. Different management strategies will vary by SRMA and will be identified in activity plans.

Future development of recreational facilities varies by alternative but impacts to cultural resources are the same for all alternatives. Any ground-disturbing activities associated with construction activities have the potential to impact cultural resources.

Alternatives 2, 3, and 4 propose to provide restrooms and other facilities adequate for anticipated uses at designated campgrounds, trail heads, and other areas where there is a concentration of recreational users. Any ground-disturbing activities associated with construction have the potential to impact cultural resources.

Alternatives 2, 3, and 4 provide for the development of one (or more) additional, free public shoreline fishing facilities on the Arizona side of Lake Havasu at Black Rock Cove, Contact Point, or Partners Point. Numerous sites are recorded in the vicinity of each of these locations. The site types range from petroglyphs and trails to small lithic reduction features. Construction of a fishing facility is not inherently a negative impact to cultural resources in the vicinity as long as direct impacts to the sites are avoided or appropriately mitigated.

Under Alternative 1 (No Action) and 3, no permits or fee would be necessary for recreation-related collection of dead and detached firewood in the vicinity (100 yards for Alternative 1 (No Action), 300 feet for Alternative 3) of their campsites for campfires. This has the potential to disturb any sites within the same area.

Under Alternatives 4 and 5 (Preferred), collection of dead and down firewood within the vicinity (100 feet) of a dispersed campsite would be authorized for campsite use only. This has the potential to disturb any sites within the same area. Alternative 5 (Preferred) allows for closing areas to wood collection in areas identified in activity plans. This would protect those sites in those areas closed to firewood collection. This has the least potential to impact to sites other than Alternative 2, which prohibits collection of firewood within the planning area.

Alternatives 1 (No Action) and 3 allow for the identification of additional competitive-use OHV areas and race course(s) to meet public need. This would have the potential of increasing adverse impacts to NRHP-eligible sites adjacent to or in proximity to the racecourses, from spectators driving over sites and collecting artifacts. The actual route(s) would be surveyed for cultural resources to prevent destruction of significant properties. The associated impacts from Alternatives 3 or 4 would be the same, and would be greater than under either Alternatives 1 (No Action) or 2 for recreation management of competitive-use OHV areas.

Recreation management for competitive-use OHV areas is similar under Alternatives 1 (No Action) and 2 (limited to the existing Parker 400 route system). Several NRHP-eligible properties are near the Parker 400 course and adverse impacts from spectators driving over sites and collecting artifacts are expected to continue. These impacts have decreased over time due to increased

monitoring during the event(s) and installation of fencing to block access to the most sensitive sites.

Under Alternative 3, paintball activities would be allowed beyond 1 mile of any established facilities or sites, campgrounds, residences, trailheads, staging areas, roads, Special Area Designations, and other areas as posted. This has the potential to impact sites (e.g., historic and prehistoric period structures, rock art sites) through paint splatter within site boundaries

From Transportation and Public Access

Cross-country travel can inadvertently damage sites from surface disturbance or provide vehicular access to previously remote areas, which may result in artifact collection, breakage, displacement, vandalism, and looting.

Designation of areas and routes as open, limited, or closed to OHV use, and selection of specific networks of roads and trails in limited use areas, provides a clearly delineated travel network, reduces route proliferation, and facilitates law enforcement. This approach generally has the beneficial effect of controlling impacts of OHV use on cultural resources.

Designations that will not change or reduce the existing footprint of OHV use will have limited potential to adversely affect cultural resources. This includes designations that allow continued use of an existing route, impose new limitations on an existing route, close an open area or travel route, keep a closed area closed, or keep an open area open. Designating routes as limited would curtail some of the traffic and add some protection for sites in the vicinity of these routes. Designating routes closed would give the greatest protection to sites in the vicinity of the closed routes.

Designations that will shift, concentrate, or expand travel onto existing routes or into areas that are likely to have NRHP-eligible sites, will increase the potential for adversely affecting sites. Designation of new routes or new areas as open to OHV use will increase the likelihood of adverse impacts to sites from surface disturbance, artifact breakage, and theft.

Publication of the designated route map after analysis of existing routes may lead to increased use of routes previously seldom used. If significant cultural resources are located in the vicinity of these routes, both intentional and inadvertent damage may occur to the sites. All alternatives prohibit cross-country travel except in “Open” areas.

Parking off of existing or designated roads for purposes of camping has the potential to damage cultural resources from compaction, artifact breakage, and displacement, resulting in loss of scientific data. Continued use of existing roads in areas of high site density may increase the potential for vandalism and damage to cultural resources. The number of eligible sites that might be impacted under the five alternatives is unknown.

Alternative 1 (No Action) allows parking within 100 yards of existing trails on lands managed under the Kingman RMP except for lands within the Three Rivers Riparian ACEC, where parking is restricted to within 50 feet of designated trails. Camping in the 100-year Colorado River floodplain is allowed during normal water levels, except all camping within 0.5 mile of Parker Dam Road is limited to designated campsites. This alternative would have the greatest impact on sites crossed by or adjacent to the existing route network

Alternative 5 (Preferred) proposes parking and camping within 100 feet of the centerline of open/ limited routes, except all camping within 0.5 mile of Parker Dam Road would be limited to designated campsites or resorts. This alternative is similar in kind and scope to Alternative 1 (No Action); impacts would be only slightly fewer because not all existing routes would be designated open/limited.

Alternative 1 (No Action) allows off-road use by authorized public land users that hold a permit or license in areas where vehicles are limited to existing roads, trails, and navigable washes and in areas not designated as ACECs or wilderness, if such travel is required to fulfill their license or permit. This has the potential to impact cultural resources if the travel crosses a site and displaces artifacts, disturbs features, or otherwise impairs site context.

Alternatives 3 and 4 would allow cross-county OHV travel in areas not closed to vehicles (e.g., Wilderness) via permit if such travel is required to accomplish a permitted or authorized use. Permit holders would be required to remove evidence of cross-country OHV use once completed. Direct impacts would be similar to those described for Alternative 1 (No Action), but may include additional impacts to sites as a result of removing evidence of use.

Approximately 5,023 acres identified as resource protection sites were designated "Closed" under previous plans. Several of these closures were to protect significant cultural resources. These closures afford protection for the sites within the closure areas. Alternative 2 also identifies these lands as closed.

From Biological Resource Management

Acquisition of non-federal lands to enhance the conservation and management of threatened or endangered species habitat, riparian habitat, desert tortoise habitat, and key big game habitat would increase public ownership and management of cultural resources on the acquired lands.

Under Alternative 5 (Preferred), vegetation management proposes to limit campgrounds near riparian-wetland areas. This allocation would enhance protection of cultural resources by reducing ground disturbance to the numerous historic and prehistoric sites located within these areas. This approach is similar in kind and scope for Alternatives 2, 3, and 4.

Biological management under Alternative 5 (Preferred) proposes to rehabilitate riparian areas, wetlands, and all springs to proper functioning condition and to

remove saltcedar (*Tamarix* spp.) and giant reeds (*Arundo donax*). Ground disturbance associated with all of these activities has the potential to adversely affect cultural resources located in areas near water and riparian vegetation, because these areas have high potential for both prehistoric and historic resources. This is the same as Alternatives 2, 3, and 4.

Wildlife habitat improvement projects would be implemented where necessary to stabilize or improve degraded or declining wildlife habitat conditions under Alternative 5 (Preferred). This has the potential to impact sites from ground-disturbing activity. This is the same for Alternatives 2, 3, and 4.

The development of springs and seeps or other projects affecting water and associated resources will be designed to protect ecological functions and processes, and to continue to provide habitat at the source for native species that may be present. Ground disturbance associated with all of these activities has the potential to adversely affect cultural resources located in areas near water and riparian vegetation, because these areas have high potential for both prehistoric and historic resources. This is the same in Alternatives 2, 3, 4, and 5 (Preferred).

Biological management proposes to restore habitat under Alternatives 2, 3, 4, and 5 (Preferred). Restoration of habitat requires removal of existing vegetation, usually by prescribed fire or cutting and grubbing of root systems followed by planting of native vegetation. This approach would impact any cultural resources at the restoration site and could adversely affect NRHP-eligible sites. Measures would be implemented to mitigate adverse effects. Manual clearing of vegetation would directly affect archeological resources by displacing surface and subsurface material through pulling, grubbing, or digging plant root systems. Such activities would compromise the scientific value of archaeological sites by disturbing the surrounding soil matrix, damaging or destroying artifacts, displacing artifacts, and disturbing the chronological sequence of deposition. The potential for illegal collection of artifacts by workers would also exist.

Under Alternative 5 (Preferred) biological management proposes to maintain and/or increase the density and distribution of wildlife waters. Some existing wildlife waters (guzzlers) are located within the boundaries of NRHP-eligible properties. Future locations also have the potential to adversely impact sites that may be eligible for the NRHP. If wildlife waters impacting significant sites are maintained in current locations, adverse effects to eligible properties will continue. This is the same as Alternatives 2, 3, and 4.

Riparian habitat not in proper functioning condition would be restored to proper functioning condition. This outcome has the potential to impact cultural resources from ground-disturbing actions where sites are co-located with riparian restoration activities.

Specific routes or portions of specific routes through WHAs established for special status species may be closed to vehicular traffic under Alternative 3. This action would also protect cultural resources in those areas from additional or new vehicular damage.

From Fire Management

Direct impacts from prescribed fire would include damage or destruction of sites and associated artifacts; destruction of organic materials such as bone, plant, and animal fibers, and wooden elements of structures; and destruction or chemical alteration in materials used to date sites (e.g., charcoal and obsidian).

Direct impacts on cultural resources from wildland fire will continue to occur, varying with fire intensity and duration.

Prescribed burns would be expected to have less severe effects on prehistoric and historic resources than would uncontrolled wildfire, which is frequently of greater intensity and duration.

Impacts from fire suppression activities will vary depending on the mechanical and/or chemical suppression methods used. Impacts from mechanical fire suppression activities would include potential destruction of artifacts and other materials, and the disturbance of site context and loss of scientific value of individual sites. This has more potential to destroy sites or artifacts than either wildland fire or prescribed burns.

From Areas Allocated for Wilderness Characteristics

Alternative 5 (Preferred) identifies three areas, totaling 48,124 acres to be allocated for wilderness characteristics. Several sites are known to exist within the boundaries of the identified areas, including sites currently managed for "Conservation for Future Use." This alternative would enhance protection for any cultural resources located within the three identified areas. This is the same as Alternative 4.

Due to the prescriptions associated with areas with wilderness characteristics, indirect impacts to sites outside these protected areas may result as adjacent lands are exposed to more intensive uses.

Alternative 2 would provide low-impact recreation opportunities and protection from mineral development, as well as protection from new ROWs and vehicle uses, thereby enhancing protection for any cultural resources located within the seven areas-identified under this alternative, totaling 182,336 acres. Nineteen sites are recorded within the lands identified. Additional sites are suspected to occur within these lands. Due to the prescriptions associated with areas allocated for wilderness characteristics, indirect impacts to adjacent lands may occur as more intensive uses shift to those lands. This has the potential for adversely affecting sites outside of these protected areas.

From Wild Horse and Burro Management

Impacts to cultural resources are essentially the same for all alternatives. Burros tend to congregate at water sources and may displace artifacts (vertically or horizontally) at those locations where water sources are at or near natural springs, thereby disturbing site context with resulting loss of scientific data from individual sites. Similar damage may occur as a result of burros trailing across significant sites.

From Special Area Designations

Increased visitation to the designated ACECs may result in both intentional and inadvertent damage to archaeological resources. Impacts include but are not limited to surface artifact theft and breakage, artifact displacement, vandalism, and unauthorized digging for artifacts

The majority of the historic period artifacts have been removed from the Schwanbeck's site, possibly by visitors using the Back Country Byway. Designation of additional byways has the potential for increased visitation, resulting in both intentional and inadvertent damage to cultural resources adjacent to the byways. .

In general, management of designated wilderness and the Cactus Plain Wilderness Study Area provides protection for sites located within those areas from vehicle use, construction of roads and utilities, and other ground-disturbing activities. The beneficial impact to sites in these areas is similar in kind and scope across all alternatives.

Please refer to the *Arizona Statewide Wild and Scenic Rivers Legislative Environmental Impact Statement* (December 1994) for analysis of impacts to cultural resources resulting from Wild and Scenic River designation.

Areas of Critical Environmental Concern

Alternative 5 (Preferred) has identified five areas for ACEC designation, totaling 74,554 acres. Four of the areas were specifically identified to protect cultural resources, one of which was also identified for Native American values. Forty-seven sites are recorded within the ACECs identified in this alternative including significant sites currently managed under "Conservation for Future Use." Sites within the ACECs would be afforded enhanced protection under ACEC management. Alternative 5 (Preferred) provides a high level of protection for cultural resources as a result of ACEC designation.

Alternative 1 (No Action) has only one designated ACEC, comprising 32,608 acres, which contains 10 previously recorded sites This alternative provides protection for these resources as well as sites located within the ACEC

that have not yet been identified. This alternative provides the least amount of protection for significant cultural resources as a result of ACEC designation.

Alternative 2 has identified nine areas for ACEC designation, totaling 138,987 acres. Six of the areas were specifically identified to protect cultural resources and two of were identified for Native American values. Eighty sites are recorded within the ACECs identified in this alternative including significant sites currently managed under "Conservation for Future Use." Sites within the ACECs would be afforded enhanced protection under ACEC management. Alternative 2 provides the highest level of protection for cultural resources as a result of ACEC designation.

Alternative 3 has identified five areas for ACEC designation, totaling 37,484 acres. Four of the areas were identified specifically for protection of cultural resources, one of which was also identified for Native American values. Five sites are recorded within these areas including several currently being managed under "Conservation for Future Use." Other than Alternative 1 (No Action), this alternative provides the least protection for significant cultural resources as a result of ACEC designation.

Alternative 4 has identified six areas for ACEC designation, totaling 77,825 acres. Four of the areas were specifically identified to protect cultural resources, one of which was also identified for Native American values. Eleven sites are recorded within these areas, including several currently being managed under "Conservation for Future Use." This alternative provides more protection to cultural resources from ACEC designation than Alternatives 1 (No Action) or 3 but substantially less than Alternative 2.

Back Country Byways

Alternative 5 (Preferred) would allow designation of three Back Country Byways during the life of the plan. If sites are located adjacent to these byways, there is a potential for damage from both indirect and direct impacts as a result of designation and implementation from visitors collecting artifacts, visitors pulling off the side of the road thereby displacing artifacts, and similar behavior. This has the potential to impact more sites than Alternative 1 (No Action) and 2 but less than Alternative 3. This is the same as Alternative 4.

Alternative 1 (No Action) has one Back Country Byway, Parker Dam Road. One site, Schwanbeck's Store, is adjacent to the Back Country Byway. This site is currently interpreted for the public. No additional impacts are anticipated as a result of this alternative.

Alternative 2 would not allow the designation of additional Back Country Byways during the life of the RMP. The impacts would be the same as Alternative 1 (No Action).

Alternative 3 would allow designation of seven Back Country Byways during the life of the plan. If sites are located adjacent to these byways, there is a potential for damage from both direct and indirect impacts as a result of designation and implementation. This has the potential to impact more sites than under all of the other alternatives.

Impacts specifically related to designation of Back Country Byways under Alternative 4 would be the same as or similar to those described for Alternative 5 (Preferred).

Wilderness Areas and Wilderness Study Area

Accommodation would be made for traditional or sacred use by Native Americans of designated wilderness and the Cactus Plain Wilderness Study Area, if needs for such uses are identified by Indian tribes.

Cumulative Impacts

There are no specific activities in General Management Plans for cities and counties that specifically impact cultural resources. Limitations to off-road special events due to the presence of significant cultural resources have the potential to impact local towns and community groups. Sites managed for public use have the potential for enhancing cultural tourism for local communities, tour guides, and local museums, particularly if a partnership is developed with county or local government. Incremental loss of cultural resources will continue due to natural processes and inadvertent or intentional damage from off-road driving, mineral exploration, and restoration activities.

Impacts on Paleontological Resources

Impacts to paleontological resources can be characterized as those allocations or actions that result in loss, degradation, or destruction of vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Avoidance is the preferred method to prevent loss, but other mitigation can reduce and resolve adverse effect to significant localities.

No impacts to paleontological resources have been identified as a result of cultural resource, rangeland/grazing, wild horse and burro or visual resource management, special designations, or areas allocated for wilderness characteristics.

From Lands and Realty

Disposal of public lands under all alternatives would also dispose of paleontological resources if they occur on said lands. This can be mitigated by conducting a records and literature search to see if sampling or survey by a qualified paleontologist would be appropriate and collecting fossil localities or conducting other paleontological research.

Ground-disturbing construction for ROWs has the potential to disturb paleontological resources. This can be mitigated by conducting a records and literature search to see if sampling or survey by a qualified paleontologist would be appropriate and collecting fossil localities or conducting other paleontological research.

From Minerals Management

Mining activities for locatable minerals and excavation and removal of Salable materials have the potential to disturb or destroy paleontological resources. This impact can be mitigated by conducting a records and literature search to see if sampling or survey by a qualified paleontologist would be appropriate and collecting fossil localities or conducting other paleontological research.

From Paleontological Resource Management

Identification and interpretation of invertebrate and plant fossil localities to facilitate collection by the public will result in the loss of these resources but enhance public education and recreation opportunities.

From Recreation Management

Development of new recreation facilities or improvement at existing facilities has the potential to impact paleontological resources due to ground-disturbing activities if fossils are present. This effect can be mitigated by conducting a records and literature search to see if sampling or survey by a qualified paleontologist would be appropriate and collecting fossil localities or conducting other paleontological research.

From Transportation and Public Access

Compaction from vehicles has the potential to crush and destroy fossils located at or near the surface.

From Biological Resource Management

Development of springs and seeps or rehabilitation of riparian areas, wetlands, or springs has the potential to impact fossils at or below the ground surface at the springs. Fossilized remains exposed at or immediately below the ground surface could be damaged or destroyed by manual or mechanical vegetation removal/treatments.

From Fire Management

Under Alternative 1 (No Action), exposed fossil resources would continue to be subject to scorching or cracking by wildland fire; however, the impact of such fires on such resources has not been quantified. Organic materials (Pleistocene and later), such as the remains of mammoths and other large land mammals, would potentially be damaged or destroyed by wildland fire and mechanical suppression activities.

Cumulative Impacts

There are no specific activities in General Management Plans for cities and counties that specifically impact paleontological resources. Limitations to off-road special events due to the presence of significant paleontological resources have the potential to impact local towns and community groups.

Impacts on Special Area Designations

This analysis covers the suitable Wild and Scenic River segments of the Bill Williams River, existing WAs, the Cactus Plain WSA, existing or potential ACECs, and existing or potential Back Country Byways. Effects to Special Area Designations (SADs) can be characterized as those allocations or management actions that result in loss, degradation, or improvement and protection of the designating values for which any one of these areas had been identified or set aside to conserve.

Data used to develop this analysis were consolidated from Geographic Information Systems (GIS) databases covering LR2000 data created by Premier Data.

The following resources will not be discussed as no direct impacts are anticipated to any existing or proposed special area designation: Paleontological Resources, Fire Management, Visual Resource Management, Wild Horse and Burros, and wilderness characteristics.

From Cultural Resource Management

Management actions described under Cultural Resources that have the potential to affect SADs are the categorizing of cultural resource sites as one of the following: managed for public use, for traditional use, for experimental use, for conservation for future use, or discharged from management. These categories establish management goals that could ether enhance or result in degradation of the designating values for SADs by prescribing management actions that would conform or conflict with the designating values.

Swansea townsite has been managed as a cultural public use site since 1995 and would continue as such under all alternatives. A direct effect of this cultural action is to enhance designating values for the potential Swansea Historic ACEC by providing for visitor use while protecting cultural sites found within the boundaries. Generally cultural prescriptions for any of potential ACECs would only enhance and maintain those values for which the potential ACEC would be designated.

Managing cultural sites within WAs could require the establishment of permanent protective structures, such as barriers or signs that could directly reduce the naturalness of locations within wilderness. Cultural sites allocated for traditional uses may require the use of mechanical transportation to allow tribal elders access to these sites. These types of actions would result in loss of solitude and opportunities for unconfined recreation. It is the cumulative impact of these types of actions that would result in loss of wilderness values over time.

From Rangeland Management/Grazing

Section 4(c) of the Wilderness Act of 1964 provides that grazing of livestock, where established prior to the effective date of the act designation of the area as wilderness, shall continue. ACECs are also open to grazing unless specific areas are removed to protect specific resources. (For example, an intaglio may be fenced to protect it from cattle and vehicles.) A loss or degradation of designating values can occur through overgrazing, and/or trailing. (See Impacts to Cultural Sites and Biological Resources.) There is a reduction in the potential to affect a designating value for a wilderness area or potential ACEC when management of rangeland resources meets the land health standards.

There are an estimated 24 range-related facilities (corrals, livestock tanks, key point monitoring sites, enclosures, etc.), 8 miles of fence line, and 3.3 miles of pipeline within the WAs/WSA. An estimated 4 miles of range fencing is found within the current boundaries of Three River ACEC. No other range facilities are found within the existing or proposed boundaries of proposed or designated ACECs. These facilities impact the naturalness of the WAs, and maintenance and/or installation of additional structures can result in degradation of designating values for these areas. Common to all alternatives is the effect of limiting any new grazing structures in Cactus Plain WSA “to those range facilities essential to maintain the area’s unique plant community…,” which

would protect the stability of the dune ecosystem, one of the designating value for the area. The RMP is not specific in detail to quantify potential effects of additional grazing structures needed over the life of this plan on those SADs listed in Table 4-6.

Under Alterative 2 all grazing activities would be eliminated. The lack of grazing could initially increase the designating values for an existing or potential SAD listed in Table 4-6. With no grazing, livestock would not be used to meet desired plant community objectives. Over the life of this plan invasive non-native plant species, currently limited through grazing, has the potential to impact the designating character or value of a wilderness area or ACEC.

It is not anticipated that any of the potential Backcountry Byways would be impacted from proposed grazing management activities. Grazing activities could be considered part of the designating values depending on the byway and the interpretive topics for that byway.

From Lands and Realty Actions

Land Tenure

Private lands (including state lands and mineral or subsurface in private ownership) within the boundaries of existing or potential SADs, while not considered part of the SAD, have the capacity to degrade the designating values for these areas if developed. Table 4-6 shows the maximum acreage that could be impacted. Acquisition of the private lands limits the possibility of surface disturbing activities, visual degradation, lost of specific values such as cultural resources, habitat, or the opportunity for solitude. Acquisition of private inholdings (common to Alternatives 2 through 5 [Preferred]) over the life of this plan could reduce loss associated with private lands development and even maintain or enhance designating specific values such as adding new cultural sites to the area. The ability of LHFO to acquire any private inholdings within any SAD is limited by future federal budgets and willing sellers.

Table 4-6. Private Lands within SADs

Special Designated Areas	Acreage by Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Wilderness Areas and WSA	22,600	22,600	22,600	22,600	22,600
ACECs	18,547	55,014	12,308	45,394	38,640
Wild and Scenic Rivers[a]	1,223	1,223	1,223	1,223	1,223
Backcountry Byways[b]	unknown	unknown	unknown	unknown	unknown

[a] Does not include acres of private/state lands already listed within adjacent WAs.

[b] As potential byways will only be completed in partnerships with local communities, it is unlikely that BLM would find it necessary to acquire easements.

Land Use Authorizations

Prospective effects from ROWs and/or leases for private or other governmental actions on public lands are similar to those listed above for development on private lands. Land Use Authorizations are not allowed within designated WAs and WSA, except for utilities and access roads that provide service to nonfederal land within these areas. So no additional impacts are anticipated for use authorizations to Designated Wilderness Areas/WSA.

Use authorizations that currently fall within other types of existing or potential SADs vary from roads, communication structures and lines, oil and gas lines, power lines, water lines, buildings, and one authorization listed in the GIS database as "for miscellaneous use." Each use authorization stipulates specific restrictions on the type of surface-disturbing activities that may be allowed and the maximum width or area authorized for these activities. For example the authorization may provide a power company a 25-foot-wide area on either side of their line, but the actual disturbance may be only 10 feet or less. Table 4-7 list the number of ROWS within different alternative SAD boundaries and provides a rough estimate of maximum acres that potentially could result in loss or degradation of designing values. New use authorizations within any SAD created by this RMP would require mitigation or stipulations to limit or mitigate those losses.

Utility Corridors

Five of the utility corridors may affect SADs as listed in Table 4-8. Nothing in the draft RMP removes or modifies existing structures found within these corridors. Maintenance activities for the existing utilities structures have the potential to degrade designating values though any surface-disturbing actions such as grading maintenance roads.

The cumulative effect of designating these utility corridors would be to concentrate any new major utility lines/structures within a 1- to 2-mile-wide area of the corridors. The potential concentration may result in loss or degradation of the designating values for the areas listed in Table 4-6.

Utility Corridor (UC) #5 crosses the Proposed Bill Williams River Scenic Segment and Three Rivers ACEC. Area of potential direct impacts is primarily state land that could be acquired by BLM during the life of this plan. Alterative one has a more stringent limitation of "no additional…utility rights-of-ways" would be authorized in the Bill William's Riparian Management Area (see Alternative 1 biological resources), which would prohibit any future utility expansion within UC #5 and would limit effects to the maintenance activities for the current pipeline within the corridor. .

Communication Sites

There is existing communication equipment on Crossman Peak, within the potential ACEC. This is not or would not be a designated communication site. Currently, there is a communication tower on private/public land, with a small BLM repeater on public lands. Both facilities are accessed by approximately 1.5-mile limited access dirt road and are powered by either solar power or generators. Not designating this peak as a communication site restricts the development on BLM lands to the existing footprint. The communication site on private lands potentially can directly impact the Crossman Peak Scenic ACEC in Alternatives 2, 3, 4, and 5 (Preferred), by requiring a ROW for the existing road and adding utility lines. BLM is required by law to provide access to private lands.

The potential Black Peak Cultural ACEC has a designated communication site on the peak. The decision to not designate this peak as a communication site would be carried forward from Alterative 1 (No Action) to all of the other alternatives. Removal of the communication equipment would restore the naturalness of this peak and would increase the religious and traditional values of the peak to the Colorado River Tribe. The spiritual importance of the peak is a designating value or feature of the proposed ACEC in Alternative 2.

Table 4-7. Percentages of Special Area Designations That Potentially May Be Impacted from Land Use Authorizations

Special Designated Areas	Alternative 1 (No Action)		Alternative 2		Alternative 3		Alternative 4		Alternative 5 (Preferred)	
	Estimated Number of Current ROWs	Maximum Percentage of ACEC Affected	Estimated Number of Current ROWs	Maximum Percentage of ACEC Affected	Estimated Number of Current ROWs	Maximum Percentage of ACEC Affected	Estimated Number of Current ROWs	Maximum Percentage of ACEC Affected	Estimated Number of Current ROWs	Maximum Percentage of ACEC Affected
Aubrey Hills	NA	NA	17	20%	14	20%	16	21%	NA	NA
Beale Slough	NA	NA	3	47%	3	57%	3	45%	3	47%
Bullhead Bajada	NA	NA	6	19%	2	10%	5	16%	5	16%
Black Peak	NA	NA	2	26%	NA	NA	NA	NA	NA	NA
Cienega Mining District	NA	NA	6	2%	NA	NA	NA	NA	NA	NA
Crossman Peak Scenic	NA	NA	23	8%	9	7%	5	15%	5	15%
Swansea Historic District	NA	NA	1	11%	2	>1%	1	15%	1	13%
Three Rivers Riparian A	8	8%	8	9%	NA	NA	5	9%	5	9%
Whipple Wash	NA	NA	1	7%	NA	NA	NA	NA	NA	NA
Bill Williams Scenic River (Segment 2)	1	10%	1	10%	1	10%	1	10%	1	10%
Totals	9	18%	68	10%	31	12%	36	9%	20	9%

Table 4-8. Percentage of ACEC Designation Affected by Utility Corridors

Special Designated Areas Affected	Designated Utility Corridors	Percentage of Acreage, ACEC				
		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Aubrey Hills ACEC	UC4 Alt 1	-	28%	-	31%	-
	Alt 2,3,4	-	28%	-	31%	
Beale Slough	UC3 Alt 1					51%
	Alt 2,3,4					51%
Bullhead Bajada ACEC	UC4 Alt 1	-	19%	18%	21%	-
	Alt 2,3,4 , PA	-	19%	18%	21%	17%
Black Peak	UC2 Alt 1	-	42%	-	-	-
	Alt 2,3,4	-	-	-	-	
Cienega Historic Mining District	UC2 Alt 1	-	3%	-	-	-
	UC2 Alt 2,3,4	-	3%	-	-	
Crossman Peak Scenic ACEC	UC4 Alt 1	-	4%	14%	<1%	
	UC4 Alt 2,3,4 ,PA	-	4%	14%	<1%	<1%
Three River Riparian ACEC	UC5 Alt 1	10%	18%	-	15%	
	UC5 Alt 2,3,4, PA	10%	37%	-	31%	31%

From Minerals Management

Mineral Disposals and/or Leasing.

Under all alternatives the wilderness areas and the Cactus Plain WSA are closed to mineral leasing and mineral material disposals; therefore no impacts are anticipated to these SADs.

Mineral disposal activities could directly impact other potential SADs. Anticipated types of impacts include large disturbances to the surface, construction of roads or expansion of existing roads, increased traffic, change in line and form of the landscape, and degradation of vegetative cover, air, soil, and water qualities. Mineral material disposals would also be permitted along Back Country Byways. Quantifying the scope of impending impact to these SADs over the life of this plan is not possible with the data currently available. The SADs most likely to be directly or indirectly impacted are those close to the population centers along the Colorado River. Alternatives 2, 4, and 5 (Preferred) limit the scope of possible impacts by restricting mineral material disposals from the potential Bullhead Bajada Natural and Cultural ACEC and Beale Slough Riparian and Cultural ACEC. Mineral disposals elsewhere in SADs would be subject to special stipulations and mitigation designed to protect designating values, which would be determined through the site-specific NEPA analysis.

All of the potential ACECs with the exception of the riparian zones within the Three Rivers Riparian ACEC are open to surface occupancy for mineral leasing under all alternatives. Approximately 238 acres within the Three Rivers Riparian ACEC would have no surface occupancy stipulations under Alternatives 1 (No Action), 2, 4, and 5 (Preferred). While the other areas could have disturbances related to mineral leasing, none of these areas have any known potential (Rauzi 2001).

Locatable Minerals

No impacts are expected with WAs as they are withdrawn from mineral entry. Cactus Plain WSA, while open to mineral entry, is subject to: BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (H-8550-1) and CRF 3802, which establishes procedures to prevent impairment of the suitability of lands under wilderness review for inclusion in the wilderness system.

Designated ACEC and Wild and Scenic Rivers would require a plan of operations to be filed for all locatable mining activity that would exceed casual use, per 43 CFR 3809. Mineral development would be subject to special stipulations and mitigation designed to protect designating values, which would be determined through the site-specific NEPA analysis.

Impending decisions under mineral management include specific acres within potential SADs to be recommended for mineral withdrawal. Once withdrawn from mineral entry, claims would not be permitted on these areas. Valid and existing rights would be maintained for claims at the time of withdrawal. The Swansea Townsite, which is located within the proposed Swansea Historic District ACEC, would under Alternatives 2 through 5 (Preferred), have approximately 200 acres recommended for withdrawal. The recommended withdrawn acres include those sites of greatest cultural importance, such as the historic buildings and foundations and the Railroad Canyon, which are eligible for listing on the NRHP. Under Alternatives 1 (No Action), 2, 4, and 5 (Preferred), approximately 238 acres would be recommended to be withdrawn from the Three Rivers Riparian ACEC and another 185 acres from within the Bullhead Bajada ACEC.

From Recreation Management

Recreation opportunities are intrinsic designating resource values for Wild and Scenic Rivers, Back Country Byways and Wilderness Areas ("*opportunities for unconfined recreation*"). While not a designating value for ACECs, recreational use is often integral to the public realizing the designating values within an ACEC. Recreation management actions can better manage this use to protect the other designating values of these area such as cultural or wildlife resources, scenic quality, opportunity for solitude, and/or naturalness of SAD. This analysis focuses on anticipated effects from BLM's recreation management actions rather than the recreational activity. A ROS inventory was completed in 2005, showing the spectrum of current recreation experience settings within the field office. WAs, WSAs, and potential Wild and Scenic River segments all currently provide a Primitive or Semi Primitive experience. Table 4-9 gives the percentage of the potential ACEC areas (by alternative) and the current type recreation experience provided by these areas. The majority of the potentially designated ACECs fall into the Semi-Primitive and Rural Natural classes. Impacts to the SADs are anticipated when these current recreational experiences, opportunities, and settings (corresponding to the ROS class) are changed from the existing situation through recreation management actions.

Table 4-9 Percentage of Areas of Critical Environmental Concern in Differing Recreation Opportunity Spectrum Classes

ACEC Alternative	Percentage					
	Primitive	Semi-Primitive	Rural Natural	Rural Developed	Suburban	Urban
1	28	25	0	47	0	0
2	1	28	59	12	0	0
3	0	32	67	2	0	0
4	0	31	66	3	0	0
5	1	18	75	6	0	0

Table 4-10 shows the percentage of potential ACEC overlapping possible SRMA allocations, increasing the likelihood of recreational management actions impacting the designating values of an ACEC.

Table 4-10 Percentage of Area of Critical Environmental Concern Acreage Overlapping Recreation Allocations

	Percentage				
	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (Preferred)
ERMA	100	49	2	42	56
SRMA	0	51	98	58	44

Notes:
ERMA = Extensive Recreation Management Area
SRMA = Special Recreation Management Area

The establishment of SRMAs and RMZ with specific management goals to achieve a recreation experience setting (ROS class) has the potential to impact special area designations. These impacts pertain to conflicts between recreation objectives and the designating values of areas that identify them as ACECs. The degree of impact is related to the amount of change in the ROS class to achieve the recreation opportunity, therefore a change from Semi-Primitive to Rural Natural would denote less of a change than one from Semi-Primitive to Rural Developed.

Table 4-11 below shows the changes under recreation Alternative 2 of ROS class on ACECs within the SRMAs. Managing 83% ACEC for Rural natural settings would afford greater protection from intensive recreation use and possibly limiting recreational development under Alternative 2. Table 4-12 below shows

the changes under recreation Alternative 3 of ROS class on ACECs within the SRMAs. ROS classes are shifted from Rural Natural to Rural Developed. Greater recreation use and an increase in development is undertaken in the ACECs and potentially impact the designating factors that may qualify as an ACEC. Table 4-13 shows the implicated changes of ROS class on ACECs within the SRMAs for Alternatives 4 and 5 (Preferred). A more resource balanced approach is provided while allowing recreational development and activities to take place.

Table 4-11. Percentage of Area of Critical Environmental Concerns within Special Recreation Management Areas by Recreation Opportunity Spectrum Class under Alternative 2

ACEC Alternative	Percentage					
	Primitive	Semi Primitive	Rural Natural	Rural Developed	Suburban	Urban
2	0	16	83	0	0	0
3	0	0	100	0	0	0
4 and 5 (Preferred)	0	0	> 99	< 1	0	0

Table 4-12. Percentage of Area of Critical Environmental Concerns within Special Recreation Management Areas by Recreation Opportunity Spectrum Class under Alternative 3

ACEC Alternative	Percentage					
	Primitive	Semi Primitive	Rural Natural	Rural Developed	Suburban	Urban
2	< 1	14	30	39	17	0
3	0	0	35	65	< 1	0
4 and 5 (Preferred)	0	0	38	54	8	0

Table 4-13. Percentage of Area of Critical Environmental Concerns within Special Recreation Management Areas by Recreation Opportunity Spectrum Class under Alternatives 4 and 5

ACEC Alternative	Percentage					
	Primitive	Semi Primitive	Rural Natural	Rural Developed	Suburban	Urban
2	< 1	16	64	19	< 1	0
3	0	0	> 99	< 1	0	0
4 and 5 (Preferred)	0	0	91	9	< 1	0

From Transportation and Public Access

The impacts from transportation and public access management are difficult to quantify. Most potential impacts from routes on special designation will be evaluated during the development of a TMN plan.

Table 4-14. Miles of Routes Impacting Areas of Critical Environmental Concern

	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (Preferred)
Aubrey Hills[a]	84	48	59	-
Bullhead Bajada	28	7	19	35
Beale Slough	21	1	2	21
Black Peak	>1	-	-	-
Cienega Mining District	24	-	-	-
Crossman Peak Scenic	175	85	125	122
Swansea Historic	45	19	36	45
Three Rivers Riparian	91	-	40	40
Whipple Wash	20	-	-	-

[a] Routes in Aubrey Hills are limited to authorized motorized vehicles only and hiking, biking, or equestrian use.

Table 4-14 above shows the number of miles from the route inventory that appears in the designated ACECs by alternative. Impacts to special area designation decrease as the number of miles decreases.

From Biological Resources Management

An estimated 70% of the potential ACECs regardless of the ACEC alternative boundary would also be allocated as WHA (except for Black Mountain, which has no acres allocated as WHA) providing for improvement and protection of the natural resource designating values.

The management action that states "riparian areas will be managed for proper function and condition," may place disruption to the "untrammeled wilderness characteristics" around springs in all designated wilderness areas and the Bill William's wild segments within Swansea and Rawhide Mountain Wilderness Area. The removal of non-native salt cedar could be required and subject to intensive management prescriptions. Restoration would enhance certain biological and scientific benefits, while both the untrammeled wilderness characteristics and the opportunity for both solitude and unconfined recreation would be reduced. The amount of salt cedar in the Bill Williams River corridor is considerable. The extent and length of this potential disturbance is depend on the method of removal and would be evaluated through future project plans.

The management action under Alternative 2 that states "to maintain, improve, and/or increase density/distribution of wildlife waters through out the planning area," could also reduce the untrammeled character of the designated wilderness areas. Without numbers or locations of new "wildlife waters" the extent of the potential affects to wilderness characteristics nor to ACECs cannot be evaluated. This action includes a statement supporting the administrative use of motorized access to wildlife water sites in non-motorized areas. The preauthorized administrative use of motorized transportation would impact wilderness characteristics in at least three locations within designated wilderness areas. The opportunity for solitude is degraded every time where mechanical transport or motorized equipment is used within a designated wilderness area. There is not enough information to completely evaluate the scope and cumulative effect to wilderness values.

From Special Area Designations

The impact on SADs are defined as the changing impacts that occur to public lands and designating values due to the difference in acreage covered by these protective measures throughout the alternatives. No impacts are anticipated from SADs for Designated Wilderness Areas, Recommend Wild and Scenic River segments or Back Country Byways.

Across the alternatives, designating values have been identified that warrant the protective mechanisms implied by the designation to an ACEC. Within the alternatives, the areas of land identified alter to accommodate varying management principles. The boundaries change to reflect other resource uses of the land and other designations and allocations that in many cases provide enhanced and/or multiple-use identities to those lands.

The scale and scope of impacts from the alternatives are very similar. Where designating values are not protected by an ACEC or another designation/allocation designed to protect or enhance these values, then the impacts can be great. Examples of these potential impacts include loss of wildlife habitat, degradation to cultural resources, and depreciation of scenic value. These impacts are discussed though the resources within this chapter.

Under Alternative 1 (No Action) protection is afforded to the least amount of land by carrying though one existing ACEC. This greatly impacts those designating values of the other areas identified in this document that are not afforded some other means of protection (e.g., wilderness, WMA, SCRMA).

Under Alternative 2 the most land is identified with each ACEC having the biggest acceptable boundaries. This affords greater protecting to larger areas, but sacrifices other resource concerns, particularly public and consumptive uses. When these uses are not in conflict with the designating values, this places unnecessary restrictions and these areas are more suitably managed under a different designation, allocation, or identification.

Only the most significant designating values are identified under Alternative 3, thus allowing other resources greater freedom. The potential impacts are similar to those mentioned above with an additional concern that by so tightly identifying those areas containing these values they might receive greater attention and be placed in greater jeopardy.

Under Alternatives 4 and 5 (Preferred) several identified ACECs have not been selected and instead different identifications and allocations have been used to provide protection for the designating values while preserving other resource concerns. The potential impacts of this approach are managerial and although initial conflicts may occur, in the longer term, interdisciplinary management will aid in the protection, enchantment, and growth of each resource.

Cumulative Impacts

The increasing pressures of urban sprawl, populations, and demand for public lands all have impacts and effects on those areas afforded special designations. In terms of Back Country Byways, impacts from increased visitation may logically be expected and will be noticeable in many respects. It is still true to say that although these impacts affect these areas, they are actually affecting those values that allow for the designations. However, the pressures from these cumulative impacts will affect and impact the planning and management that is provided to them, in some cases calling for stricter restrictions and limitations to maintain those designating values. The most direct impacts on special designations will occur here.

Impacts on Visual Resources

This analysis covers possible visual impacts to LHFO landscapes. Impacts are characterized as those allocations or actions that result in a change of form, line, contrast texture, or color of the landscape on public lands, beyond the limits permitted or established as visual resource objectives for a specific area of public land. VRM allocations set approved VRM class objectives that all management actions must meet to maintain or enhance the visual resource of an area.

Few RMP potential decisions regardless of alternative include decisions or actions that are specific enough to evaluate the intensity, duration, or context of these impacts to visual resources. All implementation actions for this RMP, or any action through NEPA, would seek by design or mitigation to meet the visual resource class objective set by this RMP for a specific location. Thus, direct impacts to visual resources have not been identified regardless of the alternatives as a result of proposed management decisions for biological resources, cultural resources, paleontological resources, rangeland management, special area designations, wilderness characteristics**,** recreation resource management, fire management, and wild horses and burros.

LHFO's 2004 VRM inventory data was used to develop this analysis in conjunction with consolidated GIS databases covering LR2000 data created by Premier Data and other GIS sources.

From Lands and Realty

Acquisitions

Private lands surrounded by public lands could impact visual resources, especially in areas where public lands would be managed to meet Class I or II objectives. This is especially true for "split estate," where there is private ownership of the minerals and public ownership of the surface. Acquiring private lands will place these lands in federal stewardship and under VRM management objectives. The overall impact of acquisitions from willing sellers of lands surrounded by public lands would be to maintain visual resources within that location.

Disposal of Public Lands

The major impact to meeting visual resources objectives would be with the disposal of public lands whereby they would no longer be in federal stewardship and subject to VRM objectives. Actual impacts do not vary between Alternative 5 (Preferred) and Alternatives 1 (No Action) through 4 for VRM (see Table 4-15 below).

Table 4-15. Estimated Percentage of Visual Resource Management Class Disposed of by Alternatives

VRM Class	Estimated Percentage of Visual Resource Management Class Disposed of by Alternative				
	Lands Alternative 1	Lands Alternative 2	Lands Alternative 3	Lands Alternative 4	Alternative 5 (Preferred)
I	NA	NA	NA	NA	NA
II	NA	>1	>1%	>1%	>1%
III	>1%	>1	1-2 %	1 %	1 %
IV	7. %	7-8%	15-16%	10-11%	10-11%

Use Authorizations

BLM would continue to issue leases/permits and ROWs for such land use activities as roads, power and telephone lines, communication equipment, temporary use permits, leases, land use permits, and easements for areas that are not identified for avoidance or exclusion. LHFO will continue to add mitigation stipulations as necessary, to Use Authorization (UA) permits, to reduce the impacts to visual resources. Thus no impacts are anticipated from the BLM's VRM program on the Lands and Realty Land Tenure Program.

Utility Corridors

Requiring that future large utility actions be placed within designed corridors would minimize the extent of impacts from these types of actions for overall visual resource quality in LHFO. Yet limiting these types of actions within a 1- to 2-mile corridor, regardless of lands alternative, will result in the loss or, degradation of form, line, contrast texture, or color of the landscape within the corridor. The difference in the lands and realty corridor alternatives is how the width of the corridor is described from existing utilities within these proposed corridors. There is really no linear difference between the lands and realty Alternatives 1 (No Action) through 4. Actions within any of these corridors will not be able to meet Class I or Class II management objects. This effect would also spill over, impacting the overall visual quality of the landscape that the corridor crosses. Locations and distance of major viewing points for the public and the topography would define how large an impact these corridors are on visual resources. Table 4-16 provides estimated miles or VRM Class I and II that would be impacted by these corridors.

Table 4-16. Potential Utility Corridor Impacts to Visual Resources

Estimated Total Miles of Designated Utility Corridors in LHFO	
Lands Alternatives 1 (No Action) through 4	618.81
Estimated Total Miles of Utility Corridors Crossing VRM Class I or II	
VRM Alternative 1 (No Action)	69.68
VRM Alternative 2	110.61
VRM Alternative 3	21.37
VRM Alternative 4	33.55
VRM Alternative 5 (Preferred)	60.73

Note: Most of the corridors have been described to be outside of designated wilderness, so majority of the miles above are within VRM Class II.

Communications Sites

New sites and development of new structures on old communication sites would be required to meet VRM management objectives. Existing structures on Smith Peak would not meet VRM management objectives for Class II. New communication towers may not meet Class II visual objectives without impacting their effectiveness. See Table 4-17 below.

Table 4-17. Existing Communication Sites by Potential Visual Resource Management Class

	Visual Resource Management Objective Classes by Alternative				
Communication Sites	1 (No Action)	2	3	4	5 (Preferred)
Lands Alternative 1					
American Cable TV	III	IV	IV	IV	IV
Black Peak	IV	II	IV	IV	IV
Citizens Utilities	II	II	IV	IV	IV
Smith Peak	IV	II	II	II	II

Table 4-17. Existing Communication Sites by Potential Visual Resource Management Class

Communication Sites	Visual Resource Management Objective Classes by Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Lands Alternatives 2, 3, 4, and Preferred Alternative					
Alamo Dam	II	II	III	III	III
Citizens Utilities	II	II	IV	IV	IV
Smith Peak	IV	II	II	II	II

From Minerals Management

The discretionary actions such as salable or leasable materials under mineral management, regardless of alternative, require design or mitigation to meet VRM management objectives for the area when necessary. Working with the proponent, BLM would seek to minimize loss, degradation of form, line, contrast texture, or color of the landscape beyond the limits permitted or established as visual resource objectives for a specific area of public land. These types of actions would temporarily impact the visual resource class objectives, with the long-term result through reclamation to maintain form, line, contrast texture, and color of the landscape.

Locatable mineral exploration and development activities have resulted in loss, degradation of form, line, contrast texture, or color of the landscape on public lands in all VRM classes. Due to the 1872 mining law, BLM has limited management oversight to restrict locatable mineral exploration. These impacts in the past have created or caused varying degrees of acceptable or unacceptable visual contrast depending on sensitivity levels of the VRM class. Any locatable mineral development now requires a plan of operations per 43 CFR 3809. The plan of operations would have to consider the VRM classification of the area and the mining plan should be designed to be as consistent as possible with the VRM class. Associated development may be subject to special stipulations and mitigation designed to protect the scenic quality in Class I, II, and III. Given the mandatory reclamation requirement of this program, long-term impacts to visual resources are being reduced.

From Transportation and Public Access Management

Vehicle routes degrade the visual naturalness of an area. This visual impact can be slight when the route is located within the bottom of a wash or extensive when crossing or traveling along ridgelines.

BLM inventoried approximately 4,368 miles of routes in LHFO by utilizing GPS. The inventoried routes do not include paved roads or streets, or routes on private land. The percentage of GPS routes by VRM class as allocated in Alternative 5 (Preferred) are estimated at 14% in Class II, 47% in Class III, and 39% in Class IV. These percentages vary little by alternative.

The majority of the existing routes are within Class III and Class IV; therefore the impacts of the routes meet the visual objectives for these two classes. Implementation of the route evaluation process would address the individual impacts to visual resources by each route, as well as the visual impacts on a landscape basis of the TMN. Under Alternative 1 (No Action) route evaluation would not occur and the visual impacts of individual routes not meeting VRM classifications would continue. Percentage change in VRM class allocation from Alternative 1 (No Action) is depicted below in Table 4-18.

Table 4-18. Percentage Change in VRM Class Allocation from No Action

VRM Class	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (Preferred)
Class I	0%	+104%	0%	+49%	+49%
Class II	0%	+71%	-44%	-44%	-17%
Class III	0%	-42%	+71%	+56%	+43%
Class IV	0%	-33%	-27%	-28%	-28%

From Visual Resource Management

VRM allocation for LHFO in this alternative comes from previous planning documents which include the Kingman RMP (Bureau of Land Management 1995), the Lower Gila North Grazing EIS (Bureau of Land Management 1982), and written descriptions of the allocations in the 1984 Yuma RMP. Since these plans were written, the population in these areas has increased and the public's sensitivity and need for open space has changed therefore Alternative 1 (No Action) does not meet current needs.

The above table shows that throughout the alternatives there is an overall decrease in VRM Class IV from the No Action Alternative; therefore more land is assigned to higher VRM classes and the possible levels of change to the characteristic landscapes are reduced.

Cumulative Impacts

Specific requests by communities to maintain the visual resources surrounding Lake Havasu City, Parker, and Bullhead and along SR 95 require that BLM management meets these concerns where possible. The visual resources on public lands enhance tourism for local communities.

Impacts on Wilderness Characteristics

Impacts to public lands with wilderness characteristics can be portrayed as those allocations or actions that result in the deterioration of wilderness-type resources: characteristics of naturalness, solitude, and primitive unconfined recreation, or the public's experience of those benefits. These include such things as actions that may decrease the natural setting of an area, cause increased interaction between users, or add evidence of human-induced management controls. Previous plans did not allocate areas for management prescriptions to maintain or enhance wilderness characteristics outside of WSAs or designated WAs and Alternative 3 also does not recommend any specific lands for this allocation.

Data from the original intensive wilderness inventory, *Wilderness Review Arizona, Intensive Inventory of Public Lands Administered by Bureau of Land Management Decision Report November 1980,* and *Wilderness and General Management Proposals to the Lake Havasu Field Office* (2003), by the Arizona Wilderness Coalition were used as a baseline for this analysis. BLM contractors completed Field reports evaluating wilderness characteristics in summer of 2004. These reports were used to develop this analysis in conjunction with consolidated GIS databases covering LR2000 data created by Premier Data and other GIS sources.

No direct impacts to wilderness characteristics have been identified regardless of the alternatives as a result of proposed actions under: Paleontological Resources, Special Designations, and the Lake Havasu Regional Management Area. The following discussions are directed to just those actions where there are anticipated effects.

From Cultural Resource Management

Nineteen sites are recorded within the lands identified for areas allocated to maintain wilderness characteristics in Alternatives 2 and one site within Alternatives 4 or 5 (Preferred). Additional sites are suspected to occur within these lands. Over the life of this plan, some of these sites may require protective actions. These actions could include permanent fencing or other types of barriers thus adding human-introduced controls and decreasing the naturalness of the public lands surrounding those sites. The lack of vehicle use in these areas would minimize the need for such actions. Actual anticipated effects from cultural resources management to maintaining wilderness characteristics are minor.

From Rangeland Management/Grazing

Effects from the management of grazing allotments that cover public lands identified to maintain wilderness characteristics are grazing structures, change in vegetative cover, and human interaction with non-native animals. Currently most

of the grazing structures and range management activities fall within the public lands evaluated for wilderness characteristics in Buckskin Mountains and Harcuvar Mountain's bajada areas that are identified for maintaining wilderness characteristics within Alternative 2. Additional water developments and/or fencing, which may be needed over the life of this plan for rangeland management to meet land health standards, could decrease naturalness on these public lands. The possibility of these types of impacts, based on current rangeland management operations and the topography features found within areas identified for maintaining wilderness characteristics under Alternatives 4 and 5 (Preferred) are not as great.

There would be no livestock grazing authorized under Alternative 2 for range management. Fences and other grazing structures would require cultural review before removal, but many of these visual impacts could be removed or rehabilitated, and this outcome would enhance wilderness characteristics. In the absence of grazing, vegetation currently utilized by cattle (especially non-native vegetation) could proliferate, and this development may affect the naturalness of the area. This alternative has a greater application to the areas in the Harcuvar bajada because this area has the most range management activities.

From Lands and Realty Management

Acquisition/Disposal

Less than 2% of all the lands inventoried for wilderness characteristics are in non-federal ownership (including minerals). Indirect effects to wilderness characteristics could include noise, dust, and other changes to the naturalness of the public lands surrounding these non-federal lands if private development occurs. Development of the private minerals or lands could also decrease opportunities for solitude. Criteria for land acquisition set in Alternatives 2 through 4 would include areas allocated to maintain wilderness characteristics, thus providing slight potential to eliminate these effects.

Utility Corridors

Approximately 9% of the lands evaluated for wilderness characteristics are also potentially in areas designated for utility corridors in Alternatives 2 through 5 (Preferred). The effects would only be realized if additional structures or actions are authorized within these 1- to 2-mile wide corridors, outside of the current footprint of the existing utility structures. Proposed allocations to maintain wilderness characteristics in Alternatives 4 and 5 (Preferred) have been drawn, where possible, to exclude the public lands identified as potential utility corridors. This approach would minimize management conflicts between these two allocations.

From Minerals Management

Salable Minerals

Salable minerals (also referred to as mineral materials) include extraction of sand, gravel, and common varieties of stone and clay. Such actions are considered "discretionary" and subject to stipulations to mitigate impacts. According to a case study in New Mexico, most operations of this kind range from 1 to 20 acres (Blodgett 2004). Environmental impacts from Salable mineral operations may include air pollution, ground water usage, increase traffic, and aesthetic degradation. According to the case study, these impacts continue even after operations have ceased. Degradation of naturalness, depending on the location, could be up to 0.5 mile or more. Potential temporary impacts include those to solitude and unconfined recreation from noise during operation hours.

Under Alternative 1 (No Action) all areas noted in previous plans as priority wildlife habitat would be closed to Salable minerals. Under Alternative 1 (No Action) approximately 77% of public lands evaluated for wilderness characteristics would also be closed to mineral material sales. Alternative 2 closes mineral sales on public lands allocated to maintain wilderness characteristics, while Alternatives 4 and 5 show that lands allocated to the maintaining of wilderness characteristics would be open to mineral material development only when there would be no lasting impacts to solitude, unconfined recreation, and naturalness.

The likelihood that salable mineral operations are to occur on any lands potentially allocated to maintain wilderness characteristics is low due to the geology within these areas and distance to major roadways and communities.

Leasable Minerals Management

Surface occupancy for mineral leasing would be permitted on lands allocated to conserve wilderness characteristics when there would be no lasting impacts to solitude, unconfined recreation, and naturalness. This has the potential to impact wilderness characteristics resources during the construction and operation of machinery needed to explore for and develop leasable minerals. None of the areas identified as having wilderness characteristics have any known potential for leasable minerals (Fellows 2001). Potential for impact to wilderness characteristics from requests for leasable minerals is very low regardless of the alternative. In Alternative 2, surface occupancy for mineral leasing would not be permitted on lands allocated to conserve wilderness characteristics; therefore there would be no possible surface impact from mineral leasing.

Locatable Minerals

The lands identified for wilderness characteristics would not be withdrawn from mineral entry, and would be subject to 1872 mining laws and current regulations. Locatable mining could impact lands with wilderness characteristics because there could be disruptions to the natural setting of an area and increased interactions between users.

From Recreation Management

Most of public lands identified, regardless of alternatives, for potential allocations to maintain wilderness characteristics are within the Extensive Recreation Management Area (ERMA) for LHFO. The opportunity for unconfined recreation is one of the wilderness characteristics, and is best described under the ROS primitive and/or semi-primitive class or opportunities. Recreational management within the ERMA would be strictly custodial and minimal in nature, such as signing, to maintain the recreational experience as inventoried. While not directly impacting wilderness characteristics, these custodial management actions would not always enhance wilderness characteristic on public lands.

From Transportation and Public Access

There are approximately 180 miles of known vehicle routes within the areas evaluated for wilderness characteristics. There is an estimated area of direct surface disturbance of 218 to 320 acres from the trail network based on an average trail width of 10 to 15 feet. Most of the routes are defined 2-track trails leading to old mines, range and/or wildlife improvements. Vehicle routes degrade the visual naturalness of area. This visual impact can be slight when the route is located within the bottom of a wash or extensive when crossing or traveling ridgelines. Visitors who use these routes with vehicles impact the opportunity for solitude. The impact to this opportunity is centered on the 6 winter months (November through April), and increases on trails nearest to population centers. Actual route designation in these areas would be accomplished in the TMN plan within 5 years. Impacts to the naturalness could occur when the open routes are signed and closed routes are reclaimed.

Motorized vehicles would be allowed to pull off 100 feet from the centerline of a designated trail. There could be a maximum of 4,300 acres affected if vehicles utilized the entire 100 feet along all trails within areas evaluated for wilderness characteristics. This outcome is highly unlikely due to rugged terrain and vegetation.

From Biological Resources

Wildlife is an important feature of wilderness characteristics and the overlapping allocations with WHA should augment the management for wilderness values for these areas. The construction of new wildlife waters may impact the naturalness of the area. Without numbers or locations of new wildlife waters, the extent of the potential effects to lands allocated for maintaining of wilderness characteristics cannot be evaluated. See Table 4-19 below.

Table 4-19. Percentage of Lands Allocated to Maintain Wilderness Characteristics and Allocated as WHAs

Alternative				
1 (No Action)	2	3	4	5 (Preferred)
NA	73%	NA	88%	88%

From Fire Management

Impacts from fire suppression activities will vary depending on the mechanical and/or chemical suppression methods used. Impacts from mechanical fire suppression activities would include potential disturbance of naturalness of an area and temporary loss of the opportunity for solitude and unconfined recreation. Without rehabilitation, impacts from suppression activities have longer duration than either wildland fire or prescribed burns.

From Visual Resource Management

VRM is a tool used to limit the impact of management actions and other surface-disturbing activities. Impact to wilderness characteristics would be the amount of change to line, form, and color that management objectives would incorporate in designing of actions on public lands allocated to maintain wilderness characteristics. See Table 4-20 below.

Table 4-20. Percentage of Potential Wilderness Characteristic Allocations Covered by Visual Resource Management Class Objectives

		Alternative			
	VRM Class:	1 (No Action)	2	3	4
Percentage of area under Preferred Alternative and Alternative 4 wilderness characteristics	Class I	0%	0%	0%	0%
	Class II	78%	85%	24%	100%
	Class III	22%	14%	68%	0%
	Class IV	0%	1%	8%	0%

Table 4-20. Percentage of Potential Wilderness Characteristic Allocations Covered by Visual Resource Management Class Objectives

		Alternative			
	VRM Class:	1 (No Action)	2	3	4
Percentage of area under Alternative 2 wilderness characteristics	Class I	0%	16%	0%	0%
	Class II	28%	65%	44%	65%
	Class III	27%	13%	49%	30%
	Class IV	44%	6%	7%	5%

From Wilderness Characteristics

Where naturalness, solitude, and the opportunity for unconfined and primitive recreation are reasonably present and of sufficient value (condition, uniqueness, relevance, and importance) but are not allocated for management prescription to maintain these values, these characteristics are subject to change and loss. Examples of these potential impacts include lost naturalness through loss of wildlife habitat, and depreciation of scenic value, or loss of solitude through increased visitor or commercial use. These impacts are discussed under other resources within this chapter. See Table 4-21 below.

Table 4-21. Percentage of Wilderness Characteristics Protected by Alternative

Alternative				
1 (No Action	2	3	4	5 (Preferred)
0	100%	0	21%	21%

Total wilderness characteristics evaluated: 197,821 acres

From Wild Horse and Burro Management

Impacts to wilderness characteristics are essentially the same for all alternatives. HMAs cover 52% of the lands identified for maintaining wilderness characteristics in Alternative 2 and 67% in Alternatives 4 and 5 (Preferred). Herd numbers, if not maintained, could impact naturalness in areas around water sources and there could be increased trailing. Limiting the number of wild burros within HMAs would enhance wilderness characteristics in areas around Fox Wash where burro trailing to Bill Williams and Lake Havasu are currently visible.

Cumulative Impacts

There are no specific activities in General Management Plans for cities and counties that specifically impact wilderness characteristics. Enhancing wilderness characteristics on public lands provides natural open space, which will become less available for future needs as communities like Lake Havasu City continue to grow. Public lands allocated for wilderness characteristics would enhance tourism for local communities.

Impacts on Wild Horse and Burro Management

No impacts to wild burro management are anticipated from the following resources and therefore are not addressed in this impact assessment: Cultural Resources, Paleontological Resources, Biological Resources, Recreation Management, Minerals Management, Special Area Designation, Wilderness Characteristics, Visual Resources Management, Transportation and Public Access, and Fire Management.

LHFO consolidated GIS databases, current HMAPs, and historic removal data were used to develop the analysis.

From Rangeland Management/Grazing

Under Alternative 2, livestock grazing would be discontinued on all allotments administered by LHFO. The Havasu-AZ HMA includes only ephemeral allotments. No direct impacts to wild burro management in the Havasu-AZ HMA are anticipated. The Alamo HMA would benefit from increased forage availability on a small portion of the HMA. Over the long term, additional forage for wild burros could be available for wild burro management.

From Lands and Realty Management

Burros using the Havasu-AZ HMA would lose approximately 2,535 acres of habitat under Alternative 5 (Preferred) plus acreage lost west of SR 95 on the north side of Lake Havasu City (which would revert to Herd Area status), and the exclusion of non-public lands from the HMA. This loss of acreage currently used for habitat would directly impact the number of wild burros the HMA would be able to sustain. Under Alternatives 3, 4, and 5 (Preferred), burros using the Alamo HMA would lose approximately 1,078 acres of habitat south of Alamo Lake adjacent to state park lands in addition to the exclusion of non-public lands and the Alamo Wildlife Area. This loss of acreage currently used for habitat would directly impact the number of wild burros the HMA would be able to sustain. Burros using the Havasu-AZ HMA would lose approximately 1,044 acres of habitat just south of Lake Havasu City under Alternatives 2, 3, 4,

and 5 (Preferred). This area is west of SR 95 and adjacent to private lands and the highway. Loss of this acreage would have a minimal impact on wild burro habitat. An additional 6,114 acres within Havasu-AZ HMA have been identified for disposal in Alternative 3 and an additional 1,491 acres have been identified in Alternatives 4 and 5 (Preferred). There are no lands identified for disposal in the Alamo HMA under Alternatives 1 (No Action) and 2.

From Wild Horse and Burro Management

Individual animals that may create unsafe situations, or that have been determined to be excess, would be captured and removed. This would create some stress for the animals involved in the process, but few die because of this stress during the capture process, and most recover quickly at the holding pens. Under Alternative 5 (Preferred), the Havasu-AZ HMA would be reduced by approximately 14,305 acres. This includes all areas north of Lake Havasu City and west of SR 95. The boundary for the Alamo HMA would be as described in Alternative 3 and would not include non-public land or the Alamo Wildlife Area. Use by burros within the WA and sensitive habitats in the eastern portion of the HMA may be mitigated through allowable use levels. The Appropriate Management Level (AML) would be 160 for the Alamo HMA and 166 for the Havasu-AZ HMA. Under Alternative 1 (No Action), HMA boundaries would remain as currently designated in existing Land Use Plans and/or HMAPs. Burros would be able to utilize a total of 559,593 acres within the Havasu-AZ and Alamo HMAs. Wild burros would continue to have access to Alamo Lake within the Alamo Wildlife Area. There would be indirect impacts on the Havasu HMA under Alternative 1 (No Action). These would be in the Parker Strip and north of Lake Havasu. Wild burros would continue to be involved in accidents with motor vehicles resulting in death to the animals and substantial damage and potential injuries to the public, and further subject to removal by BLM to reduce the safety hazard in these areas.

Under Alternative 2, acreage available within the Alamo HMA would be reduced by approximately 34%. The reduction of 94,441 acres would exclude public lands in portions of the Herd Area east of the LHFO boundary and state, private, and public lands within the Alamo Wildlife Area. With the loss of forage allocation within the wildlife area and the acreage to the east, an adjustment in the initial AML from 200 to 160 would be necessary. Under Alternative 3, acreage available within the Alamo HMA would be reduced by approximately 4%. The reduction of approximately 11,246 acres would exclude public lands within the Alamo Wildlife Area and state and private lands within the designated HMA. Under this alternative, the HMA boundary would be the same as the Herd Area boundary. However, wild burros east of the LHFO boundary would be managed for a minimum number of burros to protect sensitive habitats. With minimal numbers to be maintained on the eastern portion of the HMA and the exclusion of non-public lands and the wildlife area, the initial AML would be adjusted from 200 to 191.

Under Alternative 4, which is also the Preferred Alternative, acreage available within the Alamo HMA would be reduced by approximately 32%. The reduction of 87,780 acres would include state and private lands and public lands within the Alamo Wildlife Area. Forage allocations lost to the east and the exclusion of the wildlife area would result in a reduction of the initial AML from 200 to 160.

Cumulative Impacts

Growth in the LHFO area should continue into the foreseeable future. Sixty-four percent of the planning area is public land; however, within the Colorado River corridor private, tribal, and state-owned properties compose the majority. This is where a majority of the growth is concentrated. The Colorado River provides a crucial portion of habitat for wild burros in the Havasu-AZ HMA, particularly during the summer months. With community expansion and more extensive use of developed recreational facilities, wild burro habitat could become severely limited in this HMA. Because of the seasonal migration patterns of wild burros, it is likely that conflicts with communities such as Lake Havasu City and the Parker Strip area (in the Havasu-CA HMA) and safety issues could result in further reductions of available habitat and AML.

Conflicts with recreational uses and management constraints in the Alamo Wildlife Area, as well as special status species protection, could severely limit available and historical wild burro habitat in the Alamo HMA. As habitat is preserved for other uses, the AML would likely need to be reduced.

The estimated population of wild burros nationwide is below the approximate population when the Wild, Free Roaming Horse and Burro Act was signed. This is attributable primarily to a loss of available habitat.

Impacts on Environmental Justice

For the purposes of this planning effort, it was determined that there are minority and/or low-income populations within the planning area (see Appendix O, LHFO Environmental Justice). As part of the planning process, the Lake Havasu planning team actively solicited public participation and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.

The alternatives were analyzed for impacts and it was determined that they would not result in any identifiable negative effects that would be specific to any minority or low-income community. The impacts on the natural and physical environment that occur due to any of the alternatives do not significantly and adversely affect any minority or low-income population or community.

LHFO staff and planning team members have consulted and worked with the affected American Indian Tribes and will continue to do so in cooperative efforts

to improve communications and resolve any problems that occur. The planning team did not identify any negative or adverse effects that disproportionately and adversely affect these tribes.

It is expected that the developments and actions of the alternatives would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect negative or adverse human health effects on any minority or low-income population or community.

Impacts on the socioeconomic environment due to the alternatives are not specific to any one minority or low-income group and occur mostly within the LHFO planning area. These impacts would not occur simultaneously but are expected to unfold over a number of years, thus mitigating any potential negative effects. In addition, the planning team does not expect impacts on the socioeconomic environment to alter significantly the physical and/or social structure of the nearby communities.

Impacts on Socioeconomic Resources

Analytical Assumptions

Socioeconomic impacts for those portions of Mohave, La Paz, Maricopa, Yavapai, and San Bernardino Counties that are within the planning area were evaluated on the basis of applied logic, professional expertise, and professional judgment. Economic data, historic visitor use data, expected future visitor use, and future developments as outlined in the proposed alternatives were all considered in identifying and discussing potential impacts. Due to data limitations, a qualitative analysis was used to compare the effects of alternatives for decision-making purposes. Impacts on socioeconomic conditions would be expected to fall into five main categories as outlined below. There are no anticipated impacts from the following resources areas: Paleontological Resources, Biological Resources, Fire Management, Visual Resource Management, Areas Allocated for Wilderness Characteristics, Wild Horse and Burro Management, and Special Area Designations.

1. Rangeland Management/Grazing

Livestock grazing is a small LHFO program that affects only a few ranching entities. They depend on unpredictable annual rains to support forage production to continue their operations. Because this is a desert, drought is a way of life for these operators; active grazing use is limited in many years. This program will continue and forage production and grazing use continues to vary from year to year.

2. **Lands and Realty Management**

Recreation and Public Purpose Leases: R&PP leases continue in force for their respective terms. Renewals and development of new leases would be acted upon according to the law and policy currently in effect. Some R&PP lands may change ownership in compliance with the R&PP Act.

Disposal and Acquisition of Public Lands: Changing needs and demands for goods and services produced using public lands will continue to evolve. At times, it may become desirable to dispose of certain lands that cannot be efficiently or effectively managed by BLM. Other governmental entities may also require additional space for expansion or development of public facilities such as parks, schools, waste disposal sites, water treatment plants, or other facilities. In other situations it may be desirable for BLM to acquire additional lands to better manage existing property or fulfill various other purposes. Acquisition and disposal of lands is a valuable management tool that continues to help the BLM accomplish its mission.

Payments in Lieu of Taxes: The Payments In Lieu of Taxes Program continues to be a useful means to assist counties and local governments in providing valuable public services (e.g., search and rescue, fire protection, police, etc.) in counties that encompass large areas of federal land upon which no local tax revenues can be levied. Payments would be expected to continue as provided by law.

3. Minerals Management

LHFO contains sources of various minerals that continue to be developed and utilized now and in the future. The demand for salable minerals (e.g., sand and gravel) would be expected to increase due to increasing development within the planning area. Mining activity for locatable minerals (e.g., metal ores such as gold, silver, copper, etc.) is at a low level at present but could be expected to increase if prices make mining more economical. Currently there are no mineral leases or pending leases (e.g., oil and gas) within the field office. Leasable mineral activity is not expected at this time.

4. Recreation Management

Recreation: The demand for recreational opportunities on the public lands is expected to continue to increase, both as a result of the increasing population and also due to the growing numbers of winter and summer visitors. Public lands will continue to be instrumental in providing a wide variety of outdoor recreation opportunities for ever-increasing numbers of people. Demand for access to the same or similar land and water resources between various mutually exclusive activities (e.g., hiking and OHV use of trails) and their participants would be expected to continue. BLM would continue to provide access to suitable and available lands for a variety of outdoor recreation experiences for public use.

Special Recreation Permits: Special Recreation Permits (SRPs) and Recreation Use Permits would remain an important part of the LHFO recreation program. SRPs for commercial, organized, or competitive uses are issued in accordance

with FLPMA, NEPA, and BLM policy and fees are charged. Recreation Use Permits are daily or annual passes, for which fees are charged, that allow the public to access and use BLM recreation facilities.

Concessions: Concession activity continues according to the terms and specifications of the various leases. Some leases are renewed and additional new leases may be issued as necessary to support LHFO's recreation program.

5. Transportation and Public Access

Part of LHFO's responsibility deals with authorizing use of federal land by private or other governmental entities. BLM may and does allow some use of public lands by private interests or other governmental entities for a variety of purposes, such as access roads, communication facilities, gas and oil pipelines, utility ROWs, etc. These uses continue and serve the public good, and generate revenue as provided by policy and law.

Off-Highway Vehicle Use: LHFO would continue to support OHV use by providing access to roads and trails, and open areas designated for such use. Varying amounts of roads, trails, and open areas are available under the different alternatives.

Types of Impacts to Be Addressed

Socioeconomic

Incomplete or Unavailable Information

It is commonly expected that higher levels of visitor use and longer lengths-of-stay by tourists are related to higher expenditures in recreation related businesses such as motels, restaurants, gas stations, souvenir shops, marinas, etc. It would be expected that this is true for LHFO. The relationship between recreational use of LHFO resources and fiscal impacts on the local economy is not well known due to a lack of data specific to this regional area and LHFO. Time series data would be necessary to develop models to predict future visitor use of LHFO recreation resources. Expenditure data would be necessary to estimate fiscal impacts of recreation use. Sufficient accurate and reliable visitor use data and visitor expenditure data by activity within the affected region specific to LHFO lands are not available. It is assumed that there is a positive relationship and that the continuing LHFO recreation program makes a positive contribution to the tourism industry within the affected area. Local businesses would continue to adapt and react to actual or perceived changes in the market.

Summarized Critical Elements

Access to recreation resources and recreational opportunities and allocation of these limited recreational resources are the key elements from which recreational use of LHFO and associated problems/solutions evolve.

From Rangeland Management/Grazing

A common set of Desired Future Conditions, Land Use Allocations, and Management Actions for the Action Alternatives are described for the action alternatives. These basic planning and management guidelines serve to distinguish the action alternatives from the No Action Alternative. These updated conditions, allocations, and actions provide the basic framework from which decisions regarding Rangeland Management/Grazing follow. As such, they are improvements over the current existing conditions and provide positive, long-term benefits to the public.

Alternative 1 (No Action) and Alternative 3 allow a maximum of 14,051 Animal Unit Months (AUMs) of grazing on 1,235,573 acres open to grazing. Grazing is prohibited on 211,022 acres. The number of AUMs available for grazing varies by allotment due to the size of the area and the quality and amount of forage. The range is from a low of 247 AUMs for the Salome Allotment to a high of 4,266 AUMs for the Harcuvar Allotment. Because of extreme variables affecting forage production, operators must be flexible to take advantage of the good production years, and ready to sell everything in the bad years. Only a few of the nearly 300 farming and ranching enterprises in Mohave and La Paz Counties are able to take advantage of the grazing opportunities available on LHFO-administered land. Between 1990 and 2003, the grazing fees collected averaged only $7,717 annually.

Alternatives 5 (Preferred) and 4 are similar to the No Action Alternative, except for closing one ephemeral allotment. No ranching operations are affected, since the proposed closed allotment is currently not under permit. Those operators that have grazing allotments are aware that grazing on the public land is very much related to the rainfall received and the resulting available forage and that not all of the allotments are available for grazing every year. Affected operators adapt their operations accordingly.

In Alternative 2 a maximum of 14,051 AUMs of grazing in 17 allotments on 1,021,845 acres would be closed to grazing. The few ranching enterprises that utilized BLM forage would lose this relatively small supply. Grazing revenues would fall from an annual average of $7,717 to zero. The costs of the grazing program would also be greatly reduced.

From Lands and Realty Management

LHFO establishes a common set of Desired Future Conditions, Land Use Allocations, and Management Actions for the action alternatives. These basic planning and management guidelines serve to distinguish the action alternatives from the No Action Alternative. These conditions, allocations, and actions help provide the framework from which decisions regarding Lands and Realty Management follow. A specific focus of the lands and realty program for the three action alternatives is the acquisition and disposal of lands such that these activities contribute in a positive manner to the overall goal of providing for easier and more effective land and resource management. As such, the common management elements are changes over the current existing conditions.

Concessions: BLM manages contracts for 16 recreation-oriented concessions on BOR withdrawn lands along the lake and the river. These operations are an important part of the recreation related economy in Mohave, La Paz, and San Bernardino Counties. The facilities are primarily vacation resorts, marinas, and RV parks catering to the tourists who visit the lake and river to partake in its numerous recreation opportunities.

BLM estimates that visitors spent 5.85 million visitor days at their facilities in FY 2004. For 2003, these enterprises reported gross revenues of nearly $18.2 million and paid more than $616,500 in lease fees to BLM. Most of these facilities operate under the terms of 50-year leases that began in the years 1989 through 1996. BLM requires that the lessees invest in infrastructure and improvements to support recreation. These facilities and leases confirm that the private sector and BLM are in the recreation business for the long term. Although there will be annual use variation in the numbers of recreationists who visit these facilities and the amounts of money they spend, the actions called for in the alternatives may or may not result in any expected changes in economic impacts for the San Bernardino, Mohave, and La Paz County economies.

Recreation and Public Purposes Leases: R&PP leases continue in force for their respective terms. Renewals and development of new leases are acted upon according to the law and policy currently in effect. BLM will continue to issue R&PP leases as appropriate and in coordination with BOR on BOR withdrawn and acquired land managed by BLM. Some R&PP lands may change ownership in compliance with the R&PP Act. No change in the level and types of impacts occurs unless additional/new lands are leased. New leases for undeveloped lands result in the development of these new areas for public recreation purposes.

Disposal and Acquisition of Public Lands: BLM would attempt to acquire (title in fee simple) private land and State of Arizona land for various public purposes. When fee simple title is not obtainable or not necessary, easements to allow public access or conservation easements to protect resources could be acquired.

In addition, the land-ownership adjustment program would continue as LHFO seeks to consolidate surface and subsurface (mineral) estates under single

ownership in order to eliminate problems associated with split-estate ownership of land resources. This program would dispose of federal mineral rights under land held by private or state entities and the acquisition of mineral rights under land where the federal government already owns surface rights. Enhanced and more efficient land management is the objective.

Acquisition of private lands benefits various federal environmental programs and results in long-term, non-monetary benefits for the public. Enhancement and more efficient land management programs and activities result from obtaining control of inholdings and other lands at risk of development or overuse. Long-term cost savings for BLM may also result from these more efficiently managed areas. Willing landowners receive fair market value, either money or other lands, as compensation from the federal government.

All public lands are retained unless specifically designated for disposal. However, disposal is another valid objective of the lands and realty program for some designated lands that are isolated and/or difficult to manage. The lands are sold or exchanged and the federal government receives fair market value. The lands pass from the public domain to the private sector. Private and local cities, towns, or county governments receive the benefits of having additional land to develop for commercial or other purposes. Public land converted to private use adds to the local real estate tax base and provides additional long-term income for the taxing authorities.

Use Authorizations: LHFO responsibilities include authorizing use of federal public land by private or other governmental entities. BLM allows some use of public lands by private interests or other governmental entities for a variety of purposes, such as access roads, communication facilities, gas and oil pipelines, utility ROWs, etc. Where possible, such uses are confined to existing transportation and utility corridors. This infrastructure indirectly helps support recreation and tourism. Under Alternative 1 (No Action), current conditions would continue: current communications, utility, pipelines, and transportation activities would be supported through nine existing or proposed ROWs that are designated utility corridors. New applicants for communications, utilities, pipelines, and transportation utilize existing corridors and/or possible new corridors or sites subject to resource protection restrictions.

Alternative 2 perpetuates the continuation of rights-of-way, special use permits, leases, etc. to provide land and access that serve the public good. Four designated and seven additional (to be designated) ROW corridors would serve the needs for power line, pipeline, and other transmission, and transportation uses. Two communication sites would be undesignated (one due to American Indian concerns) and two others would remain for continued use.

Alternatives 3, 4, and 5 (Preferred) perpetuate the continuation of ROWs, special use permits, leases, etc. to provide land and access that serve the public good. A total of 12 ROW corridors would serve the needs for power line, pipeline, and other transmission, and transportation uses. This allocation includes the designation of one new corridor ROW along Highway 60 and the extension of an existing corridor. Two communication sites would be undesignated (one due to

American Indian concerns) and two others would remain for continued use. In addition, one new communication site is designated.

Opportunities for additional use of the 11 existing and/or some future new corridors are available to support and meet infrastructure growth needs. Utility and communication infrastructure are maintained and allowed to grow to serve the public good. Some construction-related expenditures for labor and materials may occur in the region (if new pipeline, power lines, etc. are developed in existing or newly designated ROWs), which provides short-term benefits for those individuals and firms involved in new construction of pipelines, transmission lines, etc.

Payments in Lieu of Taxes: Acquisition of private lands by the BLM would remove these lands from the local real-estate tax rolls. Compensation for the loss of local tax revenue to the counties occurs as increased payments-in-lieu-of-taxes from the federal government. The amounts of such payments are determined as prescribed by law. Disposal of public lands to private interests results in a compensatory reduction of the payments in lieu of taxes due to local governments. Depending on the amount of lands acquired and disposed of, the long-term changes that occur may offset each other.

From Minerals Management

The mining industry is a relatively small part of the region's total economy—about 160 jobs and $21 million out of a total of more than 63,500 positions and $1.5 billion in earnings for Mohave and La Paz Counties in 2001. Mining has declined considerably since the early 1970s both in the number of jobs provided and the income generated. Prices for materials produced and costs of production are the likely causes. Data from the 2000 census indicate that there are only one or two commercial firms in the mining industry operating in Mohave and La Paz Counties.

Development of approximately 40 new mineral sites disturbing a maximum of 1,000 acres to provide Salable minerals (primarily sand and gravel) to the public occurs during the life of this plan. One or more of these mining sites is a community pit. Sites that go out of production would be reclaimed. Some exploration for leasable minerals (oil, gas, geothermal, coal, and others) occurs but profitable production is not expected. Locatable mineral exploration continues. Some development takes place where appropriate. BLM acquires about 10,450 acres of state and private mineral rights and disposes of nearly 11,170 acres of federal mineral rights currently underlying state or private land. BLM would attempt to acquire approximately 29,420 acres of land to benefit federal programs and this land would be open to mineral entry and development. Mineral exploration is controlled to protect cultural, riparian, scenic, wildlife, and other natural resources as determined by law and policy.

Alternative 5 (Preferred) provides resource protection for the most sensitive areas, while leaving much of the field office open to mineral development. This

outcome should help to increase community access to minerals for development. Of course, LHFO will continue to be responsive to the local needs for materials and manage minerals in accordance with all applicable laws, regulations, and policies.

There are restrictions regarding surface occupancy for mineral leasing on approximately 260,000 acres to protect other natural resources. Approximately 450 acres are recommended for withdrawal. Alternative 2 prohibits any new or expansion of existing mineral disposal sites on approximately 430,000 acres to protect various types of resources located throughout the LHFO planning area. Community pits would not be authorized.

Alternative 2 seeks to maximize the protection of natural and other resources from development of leasable and Salable minerals. This alternative is more restrictive on mineral development because the largest area is closed to mineral development under this alternative.

Alternative 3 proposes increased flexibility and more development of resource use. As such, all areas are open to mineral disposal except for those areas already withdrawn, e.g. wilderness. Community pits would be allowed on a case-by-case basis. The mining industry would be under less constraint regarding exploration and development of mineral resources when compared to Alternative 1 (No Action). More sand and gravel would be available from the resource lands. Access to sand and gravel would increase for public and private uses. More exploration and development of these and other mineral resources could be expected. Nevertheless, the expectation is for only limited expansion of the mining industry within the planning area.

Again, a balance between development and use, and conservation and protection of resources characterizes Alternative 4. Authorization of community pits occurs on a case-by-case basis; therefore, some increased community access to sand and gravel could occur. In addition, new or expanded mineral activity is limited in many other areas to protect natural, scenic, wildlife, riparian, etc. values. So, greater protection is provided to additional areas, which somewhat reduces the possibility of future mineral development in the planning area.

From Recreation Management

Similar to other resource categories, the action alternatives have a number of Desired Future Conditions, Land Use Allocations, and Management Actions in common. These planning and management guidelines serve to distinguish the action alternatives from the No Action Alternative and provide the basic common framework from which decisions regarding Recreation Management follow. Thus, they are improvements over the current existing conditions and provide positive, long-term benefits to the public.

Recreation: LHFO recognizes that most people's contact and exposure to BLM occurs through outdoor recreation on public lands. LHFO provides a range of

recreation opportunities in an environmentally responsible manner consistent with maintaining public health and safety while also adhering to agency goals. Backpacking, boating, camping (both developed and dispersed), fishing, hiking, hunting, OHV use, picnicking, and wilderness travel are some of the activities available on the public lands and waters in the planning area.

Many visitors make use of the recreation opportunities provided by Lake Havasu and on the river, but increasing numbers are using the extensive lands of the Field Office. In FY 2004 approximately 3.1 million people visited LHFO-administered public lands and recreation facilities. This amount of use is on par with some well-known national parks in the west: Grand Teton National Park (2.4 million recreation visits in 2004), Mt. Rushmore National Memorial (2.0 million recreation visits in 2004), Glen Canyon National Recreation Area (1.9 million recreation visits in 2004), and Lake Mohave – which is a part of Lake Mead National Recreation Area (1.5 million recreation visits in 2004) (National Park Service 2004). Lake Mohave is most like LHFO in that it offers water oriented recreational opportunities that have not been affected by declining water levels.

LHFO lands and facilities are an important part of the infrastructure that has contributed to the growth of outdoor recreation and tourism in the region. LHFO will continue to provide lands, trails, and facilities for outdoor recreation. The desired future here is for expanded development, by the BLM or concessionaires, to meet public recreation needs while conserving the resource base and mitigating negative environmental effects. A detailed array of management actions and land use allocations designed to lead to the desired future conditions established for each alternative is presented in the Recreation Management Section, Chapter 2 of this document.

Compared to other LHFO programs, e.g., grazing, minerals, etc., the recreation program and its potential for expansion clearly generates the most economic benefits for the planning area. For example, in 2000, Mohave County agriculture contributed $8.3 million in income; and mining provided $5.2 million. At the same time, amusements and recreation resulted in $16.5 million in income; and hotels and other lodging supplied $22.0 million in income. (Economic Profile System 2004) Moreover, this situation is most likely to remain so over the life of this plan.

Special Recreation Permits: Special recreation activities and events are authorized to use the public lands through SRPs. These types of permits cover commercial, organized, and/or competitive uses of public land and are authorized contingent with its compliance with the NEPA process. A small number (10 to 12 per year) are issued as part of LHFO's continuing recreation program. Public interest in these types of recreational activities is increasing. Additional OHV areas may be designated and SRPs issued to meet this demand in accordance with NEPA compliance regulations. Fees are charged and some revenue (more than $11,500 in FY 2004) is received by the federal government.

Attendance at organized events continues to grow. Tourism businesses that cater to the motorized OHV recreation visitor tend to benefit from increased numbers

visitors to these types of special events. Also, increasing the number of special events will draw additional visitors benefiting some parts of the tourism industry. The fees received by LHFO for these activities would increase as events become larger or more numerous. On the other hand, special events tend to concentrate large numbers of people at a single site for short periods of time, resulting in intensive use and the associated impacts. Increased costs for environmental impacts, law enforcement, mitigation, NEPA compliance, traffic control, trash cleanup, etc. follow. Outdoor recreation utilizing BLM public lands remains a focus of the local tourism industry. Individuals and small groups continue to utilize BLM recreational facilities through daily or annual Recreation Use Permits. Nominal daily fees are charged and annual passes cost $50. Nearly $60,000 was collected in FY 2004.

From Transportation and Public Access

The action alternatives have quite a lot in common regarding Desired Future Conditions, Land Use Allocations, and Management Actions. These planning and management guidelines distinguish the action alternatives from the No Action Alternative. These conditions, allocations, and actions provide the framework from which decisions regarding Transportation and Public Access follow. As such they are viewed as improvements over the current existing conditions and provide positive, long-term benefits to the public.

Off-Highway Vehicle Use: BLM is the largest supplier of land and trails available for OHV use in the planning area. Most of the planning area is available for at least some level of OHV use. Only about 180,00 acres are closed to OHV use out of the approximately 1.4 million acres managed by LHFO.

Preferred Alternative 5 (PA) improves management of the transportation system on LHFO lands and supports and benefits the public and local economy over the long run. This alternative sets aside the most acreage for open, cross-country OHV use, about 9,600 acres. The amount closed to motorized use is approximately 121,000 acres. All the rest of the lands are regulated to have some type of motorized use constraint. LHFO continues to be a popular area for OHV use, perhaps more so because of additional open areas, and this use contributes to the local tourism industry.

Alternative 1 (No Action) describes where and under what conditions OHV use can occur within the LHFO planning area. The desire of the public for OHV use on the public lands, as well as the various resource conservation and protection needs and requirements as determined by policy and law, are all recognized and addressed. Use levels are established for the different areas where OHV use is allowed. Monitoring occurs to maintain or achieve the desired resource conditions for each area of use or nonuse. Corrective action happens when these desired conditions fall outside of acceptable parameters. OHV use is a popular motorized outdoor activity that contributes to the growing tourism segment of the regional economy.

All motorized use is limited to designated routes in order to conserve resources, prevent erosion, and protect wildlife habitat. Mitigation such as route closures, seasonal use restrictions, rerouting, vehicle type and speed limits, etc. would help protect resources. Although more restrictive than the Alternative 1 (No Action), the BLM lands would retain the primary and most numerous areas available for OHV use. However, the recreation-based economic sectors of the regional economy should not be greatly affected.

Visitors from outside the region should not experience much effect by OHV regulations specific to certain areas. New visitors would have a variety of OHV opportunities and experiences available, which will become their frame of reference for this activity for the future. Potential repeat visitors become aware of what LHFO offers and still have a variety of OHV opportunities and experiences to choose from to suit their interests.

Some local individuals and/or groups will react positively or negatively if certain favorite areas are not as open to satisfy their specific wants for OHV use. However, BLM's responsibility is to provide for multiple uses while protecting resources. Striking that balance may not satisfy every person's wants completely. Even so, there will still be a variety of areas, offering different OHV experiences, from which visitors and local residents may choose.

Cumulative Impacts

The five alternatives have the potential to interact cumulatively with other actions outside the scope of this plan and BLM–LHFO control and may result in additional impacts to social and economic conditions in the region.

Population growth in the region is expected to result in higher demand for recreation on the public lands from local residents. Recreational use of the public land by visitors from outside the region is also expected to increase as the local tourism industry promotes the area's recreational opportunities. It follows that economic activity is expected to expand to meet rising demand for recreation-related goods and services.

Increased commercial and residential development could add to the demand for construction materials (sand, gravel, stone, etc.) from LHFO-administered sources. In addition, added mineral development on the public lands may occur if additional resources are discovered or prices rise such that known reserves become economically recoverable.

Positive impacts on the local economy in the form of increased commercial activities and increased employment opportunities would probably occur as a result. Some businesses and some individuals may benefit from these economic activities.

Crowding of some popular recreational areas managed by LHFO may also occur with the possibility of diminished recreational experiences. Conflicts over

allocation and use of scarce resources for competing recreational uses, and between non-consumptive (e.g., wilderness recreation) and consumptive (e.g., mining) uses of LHFO public lands may increase. The various publics may or may not be satisfied with the management of LHFO public lands. Allocation of scarce LHFO resources desired by diverse publics with various and sometimes conflicting interests could become more difficult under the current outdated management guidelines.

Impacts on Recreation Resources

This section compares and evaluates the types of impacts on recreation from the various alternatives. Generally, the alternatives would have negligible impact on existing recreational facilities, but could alter how BLM provides for the increasing demand for specific types of recreation. A change in recreation activities, settings, ways, and types of access would result in a corresponding change in the opportunity to achieve a desired recreation experience. Impacts to recreation resources are characterized as allocations or actions that would result in a change in one or more recreation opportunities or available resources.

The developed recreation sites, both public and private, found within the Colorado River Management Unit are subject to the most impact from socioeconomic pressures in the area. The Desert and Bill Williams Management Units provide dispersed and undeveloped recreational opportunities that may be affected by management of alternatives such as transportation, mineral leasing, and Land Tenure.

The primary concern for recreational resources is the potential for displacing or significantly altering existing recreational opportunities. These changes could come about through land requirements and operations associated with realty actions, commercial or other types of land development, changes in OHV use, and land adjustments.

No impacts are anticipated from the following resources: Paleontological Resources.

From Cultural Resource Management

Cultural resources and recreation have strong links as many of the sites of cultural importance are in themselves attraction and destination sites for tourism. As such, providing visitor services and facilities is an affective management tool in protecting and preserving sites of cultural significance. It is in this regard that any alternatives within this section that provide protection to cultural resources and continue to allow public access increase the opportunities for this type of recreation. By providing these recreation opportunities and appropriate investment in outreach, a user ethic can be instilled that gives visitors an appreciation of the importance of these sites and the desire to protect and

preserve them. In certain circumstances cultural sites are of such scientific importance that they should be closed to public use and it is here that there is the greatest impact on recreation.

The decision to provide immediate and long-term in-place preservation and protection of selected cultural resources that are threatened or deteriorating has the potential to affect recreational opportunities.

Development of public use areas would directly maintain opportunities for a variety of recreational experiences relating to the cultural resources at the site. Specifically, sites would have interpretive and educational components. Access for multiple users would be improved, and sites would be stabilized and preserved for future recreational opportunities.

Allocation to the "Public Use" category could lead to increased visitation and opportunities for education. Sites allocated to "Public Use" category are generally interpreted for the public and, in some cases, have site improvements such as picnic tables, campsites, and route systems. Site improvements may result in a commitment of both staff time and budgetary resources for maintenance. The number of sites allocated to this management category varies among the alternatives as shown in Table 4-22 below. Beyond this, the allocation of cultural sites may or may not have further impacts on recreation opportunities, depending on the management action, restrictions and limitations provided to them.

Table 4-22. Allocation of Cultural Sites by Alternative

Site Allocations	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Public Use	1	7	12	8	8
Conservation for future use		35	25	28	28
Traditional use		7	5	7	7

From Rangeland Management/Grazing

The management of allotments for grazing has very little physical impact on recreation. The alternatives that pertain to the removal of lands available to grazing have the potential to increase recreation opportunities by returning the lands to their natural state. Those alternatives that indicate the building of additional rangeland improvements such as fences, cattle guards, and gates—although not physically impacting recreation—do affect the perceived ability to use those lands.

From Lands and Realty Management

Land Tenure

LHFO will continue to have the ability to dispose of identified lands. On a case-by-case basis BLM will have the ability to acquire lands. All public lands would be retained containing any developed or maintained recreation facilities. Acquiring lands in the identified areas could benefit a number of recreation activities including access by connecting public land parcels.

Where land disposals take place on the outskirts of communities, recreational use in these areas would be forced to relocate, potentially having greater impact for other resources.

Use Authorizations

Use authorizations, including those in utility and transportation corridors, are not anticipated to have impacts on recreation until potential projects are identified. These corridors may continue to be used for recreation activities (except for existing ROWs that may be posted). Allowing development of utility distribution systems could reduce potential public access for OHV opportunities if restricted to authorized users.

NEPA analysis of each proposed project would determine potential impacts to recreation such as effects to route access, and any existing or new routes that would be used for maintenance facilities that may be closed to public use.

Communication Sites: No significant impacts are expected on recreational resources from these alternatives. However the change in communication abilities of the area has the potential to impact visitor services and the social experience of the recreational settings in terms of the communications abilities of BLM staff, law enforcement and emergency services, and the visitors themselves.

From Minerals Management

The alternatives from minerals management will close certain areas to mineral development. Areas that are closed to mineral development would enhance recreational opportunities because there would be no commercial traffic relating to the development and there would be no visual, noise, or air quality impacts. For the areas that remain open during the life of the plan there could be approximately 1,700 acres of new disturbances relating to mineral development. The lands immediately surrounding these areas could affect recreational opportunities because there could be increased traffic, dust, noise, and the visual impact associated with mineral extraction.

The only areas closed to mineral leasing are the WAs and the WSA that cover 179,138 acres. No leasing activity would occur within these areas that would best protect current recreational opportunity.

The expectation for the leasable program is that there would be a maximum of 17 exploration wells drilled during the life of the plan with a total disturbance of less than 120 acres. The exploration activities could impact recreation because there would be a visual impact when an area is being drilled, and traffic related to drilling would increase. The impact would be short-tem (less than 6 months). There is not an expectation that any developable resources would be found.

Areas withdrawn to locatable minerals include wilderness and BOR withdrawn and acquired lands. There can be no locatable mineral development on these lands, which cover 192,000 acres. The recreational activities would benefit from this because there will not be any exploration or development of a mine on these lands. The proposed acreages to be withdrawn under the alternatives are very similar and are not expected to have a great impact on recreation since they cover very small areas.

From Recreation Management

Increasing demand for recreation opportunities creates more pressure for BLM to provide greater recreation resources. Such resources include areas for play, campsites, facilities, interpretative and visitor service programs.

Any decision or activity made will have impacts on recreation. In the wider scope this will mean that more planning, managing, staffing, and funding is required to achieve the goals for recreation management. The potential gained from making these alternatives reality could make the LHFO planning area more nationally significant as a recreation destination (similar to a national recreation area), thus further increasing demands on these resources.

Decisions outlined in Alternative 2 provide for low-impact recreational experiences. These include wildlife watching, hiking, and birding. More intensive recreation activities are still provided for; however, they are limited to those areas already identified for those activities. These intensive activities may undergo more restrictive management. The alternative therefore has the greatest impact on recreation.

Alternative 3 shares a lot in common with Alternative 4: they provide greater opportunities for intensive recreation experiences, such as OHV activities and power-boating. These alternatives have the least impact beyond the status quo.

Alternative 4 strives to balance low-impact and intensive opportunities with other resource needs. It provides strong visitor services programs to educate and instill an ethic of environmental preservation, while enabling the public to have access to desirable recreation spaces, settings, and activities.

From Transportation and Public Access

Impacts on recreation from transportation and public access are those that would occur though the designation of routes and areas as either open closed or limited. As part of this designation process routes would be evaluated. Included in this evaluation process would be the recreational value of the route. This therefore has the opportunity to improve recreation resources and opportunities; however, in areas where other resources take precedence over that of recreation, routes could be closed or limited, thus reducing the overall network of routes and opportunities for exploration.

Where restoration of routes not found on the 1995-2004 inventory occurs, great impacts on recreation are foreseeable assuming that current accepted use patterns are not reflected accurately in the plan.

Any alternative that seeks to open or develop new routes—whether OHV, hiking, mountain biking, or equestrian—has the potential to improve recreational resources and opportunities. Specifically, Alternative 3 seeks to develop access to Lake Havasu though the Lake Havasu Aubrey Hills and Alternative 5 (Preferred) seeks to develop a hiking trail to run parallel to Lake Havasu though the Lake Havasu Aubrey Hills.

From Biological Resources Management

All of the biological alternatives have the potential to greatly affect recreation opportunities available within the LHFO planning area. In one regard alternatives that set out to protect habitat and wildlife and fisheries will increase the recreational opportunities for wildlife viewing, habitat and scenic appreciation, hiking, equestrian activities, and fisheries-related sports. However, the limitations and restrictions needed to protect wildlife will ultimately have a wide reach and affect recreational opportunities including but not limited to dispersed camping, OHV sports, target shooting, and boating activities. With this in mind, alternatives that are selected will have to balance the need for biological resource protection with the necessity to provide sustainable opportunities for recreation. Biological alternatives can either be of little consequence or of great impact depending upon scope and magnitude of the species-specific requirements. Of all resources that conflict with recreation, the biological resources could have the potential for the greatest impacts.

Executive Order 12962 – Recreational fishing opportunities: This alternative increases awareness of and support for sport fishing on Lake Havasu.

Facilities in riparian areas – The limitation on developing no new recreational facilities near riparian wetland areas could have significant impact on recreation and could specifically affect the Lake Havasu shoreline. The option of relocating facilities would be impossible to manage and expensive to achieve. This alternative conflicts with the public demand and use pattern.

Bighorn sheep lambing grounds – Seasonally restricting motorized vehicle use into designated bighorn sheep lambing grounds would have impacts on recreational users. These impacts, although seasonal, would have the most impact on recreation.

No-wake zones – The establishment of no-wake zones along the Arizona shoreline, in the context of BLM's shoreline camping and day use sites, could have great impact to current recreational use patterns. The sites are accessible only by boat. A large percentage of this use is boat camping and associated water play. If large expanses of shoreline are restricted to no-wake zones much of the water play such as personal watercraft riding, tubing, water skiing, and wakeboarding would be generally forced further out into the lake, nearer the navigation routes, increasing the possibility of dangerous conflict with high-speed boats. Currently, many families choose to camp at sites that are in protected coves or shorelines to provide a safe area within which children can participate in the above-mentioned activities without conflict with traffic.

Wildlife Corridors: The establishment of wildlife corridors could have significant impacts to the recreational user by restricting activities within these areas.

From Fire Management

There are very few impacts on recreation from fire management; however when special fire restrictions are in place certain recreation opportunities are diminished, including campfires, barbecues, smoking, and the operation of engines without spark arrestors.

From Visual Resource Management

Managing VRM can have impacts and implications on both the recreational opportunities provided and recreation management. These include limitations on the locations and aesthetics of new facilities and the allocation of lands to different recreation uses. However VRM can also provide for enhanced recreation settings and opportunities by allowing for a more natural landscape and enhanced and protected scenic views in those areas where recreation occurs.

Alternative 2 provided more land acreage to a higher VRM class. Essentially, this places greater restrictions on the developments and activities that can occur within these areas, but increases the opportunities for scenic appreciation, and low impact recreation. This alternative has the most impact on recreation.

Alternative 3 provided the least restriction on recreational uses and development of public land and therefore the least impact on recreation. Alternative 4 provides a balanced approach to VRM along with other resources and management goals. There would be greater impacts than Alternative 3.

Areas Allocated for Wilderness Characteristics

The amount of acreage that would be allocated for wilderness characteristics varies by alternative. These alternatives would provide low-impact recreation opportunities and protection from mineral development, new ROWs, and vehicles use and would thereby enhance protection for any recreational resources located within the seven identified areas.

From Wild Horse and Burro Management

As wild horses and burros are vestiges of the American past, the public's ability to catch glimpses of them in the wild is an enhancement to any recreational activity on the public lands. The introduction of burro information to existing kiosks supports this condition and increases public knowledge and appreciation.

From Special Area Designation

Designation of a Back Country Byway could affect the recreation setting along the byway by increasing traffic and interaction among recreational users. The interpretive elements associated with the byway would increase visitor awareness and appreciation of the natural and cultural resources. Opportunities for more primitive recreational experiences in the Bill Williams Wild and Scenic River Corridor could be diminished.

Designation of a Back Country Byway may have a minimal increase to overall visitation. The identified potential Back County Byways are popular and well-traveled roads that help make them suitable for Back County Byway designation. Conflicts with OHV users could increase because of the increased traffic on the byway. Moreover, there could be an increased potential for accidents at OHV trail and byway intersections, because drivers may not expect multiple trail crossings in the area.

Management of the ACECs would not have direct or indirect impact to recreation opportunities because the management identified can be done under the Proclamation. The closing of routes could limit access for some visitors in the area and diminish motorized recreation opportunities, but closure is currently permitted to protect Monument objects (including wildlife), and these impacts could be realized without the ACEC designation.

Designation of additional ACECs would indirectly affect recreation by enhancing the opportunities for primitive recreation activities in a natural setting. Non-motorized trail systems would be enhanced, and conflicts among different user types would be reduced. Selected routes within the ACECs would be closed to protect resources; these closures would directly affect opportunities for motorized activities. In the Harquahala Mountains, the future development of recreation sites would be prevented, and opportunities to experience the area in a

more developed setting would be decreased. The lack of parking, interpretive, and staging facilities would disperse motorized activities.

Outstanding opportunities for backpacking, hiking, camping, hunting, and nature study would be maintained within the five designated wilderness areas.

Cumulative Impacts

There are many different influences and pressures on the recreation resources within the management area. The ever-increasing urban populations, the growing list of threatened or endangered species, and the demand on the land from other resource uses all contribute to a substantial change in the traditional public lands use ethic. These cumulative effects reduce the amount of public land available for unrestricted recreational use, disrupt the traditional recreation patterns, decrease the opportunity for motorized recreation, and impede public enjoyment of the lands.

It is foreseeable that there will be future impacts from environmental regulations and interest groups that influence the allocation and development of areas for recreation and the types of recreational activities than can occur.

The end result is the necessity to provide the public with high-value recreation opportunities, providing for and receiving fair value, while instilling a strong user ethic of land stewardship.

Impacts on Rangeland Management/Grazing

Impacts to Grazing Management would primarily be to forage allocation. Under Alternatives 1 (No Action), 3, and 4, the current allocation of 14,051 AUMs would continue. Under Alternative 2, allocations for livestock use would be discontinued, resulting in 14,051 AUMs available for allocation to other resources. As land health evaluations are completed, the total use authorization may be adjusted. Other impacts would be acres available to livestock use. Under Alternatives 1 (No Action) and 3, 1,021,842 acres would be open to livestock use, and 15,192 acres would remain closed to grazing use. Under Alternative 2, 1,037,034 acres would be closed to livestock use. Alternative 4 would have 994,800 acres open to livestock use and 42,234 acres closed to livestock use.

No impacts to grazing management are anticipated for the following resources and therefore are not addressed in this impact assessment: Cultural Resources, Paleontological Resources, Recreation Management, Minerals Management, Special Area Designations, Wilderness Characteristics, Visual Resources Management, Transportation and Public Access, and Fire Management.

Maps generated through the consolidated GIS databases were used to develop this analysis.

From Rangeland Management/Grazing

All livestock grazing would be in compliance with the Arizona Standards for Rangeland Health and Guidelines for Grazing Management and the regulations at 43 CFR 4100. There would be no impact to livestock grazing use under Alternatives 1 (No Action) and 3. There would continue to be five Ephemeral and 12 Perennial/Ephemeral Allotments within LHFO. Permitted use would continue to be authorized at 14,051 AUMs with no initial adjustments to existing permits. Applications for ephemeral use would be considered in accordance with Standard 3, Guideline 3-5 of the Arizona Standards for Rangeland Health and Guideline for Grazing Administration. Monitoring data would be collected and analyzed to determine if current management meets the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration or if changes in use, season of use, or other actions are necessary to meet the objectives for the allotment. Under Alternatives 4 and 5 (Preferred), the Havasu Heights South Allotment would be cancelled. The Havasu Heights South Allotment has not been used for livestock grazing in the last 20 years, and is currently unpermitted; there would be no impacts of retiring this ephemeral permit. Under Alternative 2, livestock grazing would be discontinued on all allotments administered by LHFO. This would directly affect 17 permittees, and result in 14,051 AUMs of forage no longer available for livestock being available for wildlife and burros where applicable. Under this alternative, the RMP would decide that allocation forage for livestock use is no longer appropriate for lands within LHFO. This decision would directly affect the permittees on 12 perennial allotments. On the ephemeral allotments, there has been no licensed use over the last 10 years, so there would be no impacts to these operators.

As grazing permits are retired, rangeland improvements such as wells, fences, and corrals would be removed by the owner of these improvements, or other options would need to be explored. LHFO budgets could be stretched as the BLM would be required to pay affected permittees for the amortized cost for these improvements.

From Lands and Realty Management

Lands identified for disposal would have no impact to grazing until a Notice of Realty Action is published. Approximately 51,949 acres have been identified for disposal in Alternative 1 (No Action). Most of these lands are located adjacent to rapidly developing areas that by themselves are adversely affecting livestock grazing. These disposals would affect 36,757 acres within the following allotments, Crossman Peak, Nine Mile, Muse, Crowder-Weisser, Calhoun, Hancock, and Harcuvar. As the realty actions become reality, there would be less public land available for grazing, and a reduction of up to 506 AUMs permitted use in accordance with the grazing regulations.

Livestock grazing use would be directly affected by the disposal of approximately 34,159 acres of public lands under Alternative 2. There would be a loss of usable acreage and forage, and ultimately a reduction of permitted use.

Any reduction in permitted use would be determined on a case-by-case basis as lands are transferred out of public ownership. Under Alternative 2, loss of permitted use could be as high as 291 AUMs. Disposal of 83,475 acres in Alternative 3 would directly affect livestock grazing and result in a loss of as much as 699 AUMs. Livestock grazing use would be directly affected by the disposal of approximately 56,715 acres of public lands under Alternatives 4 and 5 (Preferred). There would be a loss of usable acreage and forage and ultimately a reduction of permitted use. Any reduction in permitted use would be determined on a case-by-case basis as lands are transferred out of public ownership. Under Alternatives 4 and 5 (Preferred), loss of permitted use could be as high as 480 AUMs.

From Recreation Management

Alternatives 3, 4, and 5 (Preferred) for Recreation Management promote expanded camping, and vastly expanded, dispersed open OHV areas, with washes open to traffic. Increased dispersed camping and OHV use will lead to more frequent confrontations between livestock management and recreation management. Impacts to grazing use from Alternatives 3, 4, and 5 (Preferred), combined with growth in the rural areas of LHFO would be significantly greater than those of Alternative 1 (No Action). This alternative provided liberal transportation guidance that enabled a high density of dirt trails and access throughout grazing allotments, including desert washes. This access would impact soils and indirectly create more confrontations between livestock management and recreation management.

From Biological Resources Management

Livestock grazing use would continue to be guided by the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, as well as the Code of Federal Regulations at 43 CFR 4100 and other policies including, but not limited to, permitted use, rangeland improvements, period of use, and class of livestock. The regulations have established procedures to insure due process for any adverse action. Should any reseeding or site rehabilitation be completed within an active grazing allotment, grazing would be deferred to allow the desired vegetation to become established. This would be a short-term impact on permitted use, with improved grazing use and distribution being long-term benefits.

Cumulative Impacts

Effects to the grazing program on public lands will combine with those discussed above to produce cumulative impacts to grazing resources and use.

Growth in the LHFO should continue into the foreseeable future. Sixty four percent of the planning area is public land; however, within the Colorado River corridor private, tribal, and state-owned properties compose the majority. This is where a majority of the growth is concentrated. However, there are large blocks of private land, particularly in the vicinity of Wenden, Salome, Hope, and Brenda, which are becoming heavily used by RVs during the winter months. Further, several roads have been upgraded by the county in this area through several grazing allotments. Because of the expanding use of these areas for various forms of recreation and the county improving access for such activities, livestock grazing use would continue to be adversely affected. These activities include developed RV parks, home sites, businesses, and many of the visitors utilizing the public lands for off-road vehicle travel. These activities will disrupt existing grazing use, particularly as cattle are excluded from these uncontrolled private lands as they are developed.

Impacts on Mineral Resources

This analysis discusses the impacts of the various alternatives on the development of minerals on public lands. Many of the decisions within the Minerals alternatives have been driven by the need to prioritize other resource concerns over those of the minerals program (for example, cultural, biological and recreation). This prioritization comes from conservation laws and management goals and objectives.

The following resources were analyzed and determined not to have any impacts on mineral development: Air, Water, Soil, Wild Horse and Burros, Socioeconomic Resources, and Rangeland/Grazing.

From Cultural Resource Management

The presence of cultural resources has potential to affect mineral development. Depending on the type of resource found, mitigation or avoidance of the site may be required. The alternatives contain minerals decisions written to protect important known cultural sites from mineral development and therefore mineral development is restricted in those areas identified. The alternatives vary with Alternative 3 being least restrictive and the other alternatives providing varying levels of restrictions to mineral development in regards to cultural resources. Impacts by decision are included the paragraphs following Table 4-23.

Table 4-23. Comparison of Cultural Resources Protected by Alternative

	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Salable Minerals	Cultural sites, areas, and site complexes*	Swansea Townsite Cultural sites,		Swansea Townsite Cultural sites,	Swansea Townsite Cultural sites,

Table 4-23. Comparison of Cultural Resources Protected by Alternative

	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Restricted areas		areas, and site complexes[a] SCRMAs		areas, and site complexes[a] SCRMAs	areas, and site complexes[a]
Leasable Minerals Areas with a No Surface Occupancy Stipulation	Cultural sites, areas, and site complexes[a]	Cultural sites, areas, and site complexes[a]	Cultural sites, areas, and site complexes[a]	Cultural sites, areas, and site complexes[a]	Cultural sites, areas, and site complexes[a]
Locatable Minerals	Bullhead Bajada Area	Swansea Townsite	Swansea Townsite	Swansea Townsite	Swansea Townsite
Areas Recommended for Withdrawal		Incline Railway		Incline Railway	Incline Railway

[a] Cultural sites and areas, and site complexes managed for conservation for future use, traditional use, and public use.

The restriction of mineral material sales from the Swansea Townsite should not have a great impact on Salable minerals. Swansea Townsite is in a fairly remote location that may make it uneconomical to haul material to market from that location and the area is also classified as low potential for sand and gravel (see Map 3-7).

The restriction of mineral material sales from the cultural sites and site complexes managed for conservation for future use, traditional use, and public use as specified in the Cultural Resources section should have a minimal impact on Salable minerals. These sites mostly cover very small areas, usually less than 1 acre, and mineral material disposal could easily be moved to avoid these locations. Some of the locations are remote and are not readily accessible as a material site and other locations nearer the river mainly cover very small areas.

The restriction of mineral material sales from the SCRMAs could impact mineral material sales, especially in the Bullhead City area where there is moderate to high potential for sand and gravel. The other SCRMAs are mostly located within areas that have a low potential for sand and gravel (see Map 3-7). The areas have potential for mineral materials but would not be developed.

The no surface occupancy stipulation for leasable minerals on the cultural sites and site complexes managed for conservation for future use, traditional use, and public use as specified in the Cultural Resources section should have a minimal impact on leasable minerals. Most of the cultural sites are very small and the drill site wouldn't need to move very far to drill to nearly the same location, or

directional drilling could be used. The largest site is the Swansea Historic Townsite, and there is no known potential for leasable minerals at that location (Map 3-9).

Withdrawing the Swansea Townsite could impact locatable mineral development. The area recommended for withdrawal covers approximately 200 acres and includes those sites of greatest cultural importance, such as the historic buildings and foundations and the Railroad Canyon, which are eligible for listing on the NRHP. The site is currently withdrawn for an R&PP application by La Paz County. The townsite is located in an area of historic mineral production and has moderate and high locatable mineral potential (see Map 3-8) and those resources would not be developed.

Withdrawing the Incline Railway in the Harcuvar Mountains may impact locatable mineral development and should not impact Salable and leasable mineral development. The area recommended for withdrawal covers approximately 10 acres and includes the most significant cultural resources. There is moderate potential for locatable minerals (see Map 3-8), low potential for sand and gravel (see Map 3-7) and no known potential for leasable minerals (see Map 3-9).

Withdrawing the approximately 1,280 acres in the Bullhead Bajada could impact some mineral development. The western portion of the withdrawal area has moderate to high potential for sand and gravel (see Map 3-7) and low potential for locatable minerals (see Map 3-8). The eastern portion of the withdrawal area has moderate potential for locatable minerals (see Map 3-8). There is no known potential for leasable minerals within this area. These areas would not be developed.

From Lands and Realty Management

Several of the previous plans addressed consolidation of the surface and mineral estates. There are approximately 160,000 acres of split estate, which consists of public surface and private minerals and approximately 25,000 acres of private surface and public minerals. Consolidation of the mineral estate would streamline management for both BLM and private entities. Acquiring the mineral estate could open more land to mineral development and disposing of the mineral estate could lessen the amount of land available to mineral development.

Disposal of public lands could remove those areas from mineral development. A good portion of those lands are near developing communities. When the lands are disposed the cost of marketing the mineral materials could raise the cost to the consumer due to longer hauling distances.

The acquisition of lands with the mineral estate may provide more opportunities for mineral development if the acquired lands are open to mineral development.

From Minerals Management

There are positive impacts from mineral material sales that may include less trespass, which is unregulated and the impacts are unmitigated. Also there could be less mineral removal from federal surface-private mineral estate, which BLM has less control over.

Any of the minerals alternatives that seek to restrict mineral development reduces the opportunity for new mines and mineral exploration within the field office and these decisions will be analyzed below for their impacts. Conversely, alternatives that allow for mineral development promote mineral usage within the field office.

Authorization of community pits could benefit communities that have demand for such areas. These sites could provide material for a lower price for people needing that material in a certain area. If community pits were not to be authorized, the general public would have to purchase mineral materials from other operators.

In Alternative 5 (Preferred) there would be no mineral material disposals with the Aubrey Hills area. This will close the area west of SR 95 south of Lake Havasu City to mineral material development. The area adjacent to the highway has moderate to high sand and gravel potential that would not be developed.

For lands within the former Yuma RMP area, BLM would establish community gravel pits where appropriate and all sales would be made from these pits. If all sales were to be made from a community pit, there would more likely be more theft of minerals and there would need to be more inspection and enforcement as a community pit can be difficult to manage. There would be more small sales to the general public and larger operators can operate out of community pits also. The community pits would have to be fairly large to accommodate all of the users and may have greater impact on other resources respective of having a greater number of smaller single-operator locations.

For lands within the former Kingman RMP area, mineral material disposal would be authorized only when no reasonable management alternative could be identified and the disposal would not conflict with objectives for the area. This decision seems fairly ambiguous and could have a broad interpretation to limit mineral development.

From Paleontological Resource Management

Areas defined as Class 4 would be required to have a records search and/or a survey before earth-disturbing activities relating to minerals authorizations. Monitoring may also be required during the activities to protect paleontological resources. Minerals actions may be delayed if paleontological resources are found. Paleontological resources were not addressed in previous plans.

From Recreation Management

There would be no mineral material disposals from the Lake Havasu Special Recreation Management Area in Alternatives 2 and 4. The Lake Havasu Special Recreation Management Area surrounds Lake Havasu and there is potential for mineral materials, especially near SR 95; this potential would not be developed (see Map 3-7).

From Transportation and Public Access

Restricting mineral material disposals from the Open OHV areas and RMZ managed for OHV activities would impact Salable minerals because these areas have high to moderate potential for sand and gravel.

Closed areas currently require Mining Plans of Operations for locatable mineral development per 43 CFR 3809. Persons wishing to develop minerals within these closed areas would have to file a Plan of Operations. A Plan of Operations could be more costly and time consuming for the miner to file and would take more time for BLM to process than a notice would.

From Biological Resources Management

The presence of biological resources has potential to affect mineral development. Depending on the type of resource found, mitigation or avoidance of the site may be required. The alternatives contain minerals decisions written to protect biological resources from mineral development and therefore mineral development is restricted in those areas identified (see Table 4-24 below). The alternatives vary with Alternative 3 being least restrictive and the other alternatives providing varying levels of restrictions to mineral development in regards to biological resources. Impacts by decision appear in the paragraphs following the table.

Decisions relating to the riparian areas of the Three Rivers ACEC are covered under the Special Area Designations section.

Table 4-24. Comparison of Biological Resources Protected by Alternative

	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Salable Minerals Restricted areas	Bill Williams Riparian Management Area Priority Wildlife Habitat Areas (YRMP)	Riparian Areas Desert Tortoise Category I Habitat Bighorn Sheep Lambing Grounds	Bighorn Sheep Lambing Grounds from January 1 through June 30	Riparian Areas Desert Tortoise Category I Habitat Bighorn Sheep Lambing Grounds	Desert Tortoise Category I Habitat Bighorn Sheep Lambing Grounds from January 1 through June 30
Leasable Minerals	No Surface Occupancy on Bighorn Sheep Lambing Grounds and Springs in priority wildlife Habitat No Surface Occupancy on all riparian areas (YRMP)	Exploration and Construction only from July 1 through December 31 in Bighorn Sheep Lambing Grounds No Surface Occupancy within 0.25 mile of Rivers	Exploration and Construction only from July 1 through December 31 in Bighorn Sheep Lambing Grounds No Surface Occupancy within 0.25 mile of Rivers	Exploration and Construction only from July 1 through December 31 in Bighorn Sheep Lambing Grounds No Surface Occupancy within 0.25 mile of Rivers	Exploration and Construction only from July 1 through December 31 in Bighorn Sheep Lambing Grounds No Surface Occupancy within 0.25 mile of Rivers
Locatable Minerals	Lambing Ground restrictions from December 15 to April 15 in Little Harquahala and Harquahala Mountains				

Restricting mineral material sales from riparian areas should not have a great impact on Salable mineral development. The riparian areas are generally small and covered with vegetation, which would increase operational costs due to the

necessity to clear and salvage vegetation before operations can begin. Sites would also have to be reclaimed at the conclusion of operations. The riparian areas cover a very small portion of the planning area (5,780 acres) and mineral material sites could be located elsewhere.

Restricting mineral material sales from priority wildlife areas could impact to Salable minerals. Most of the priority wildlife areas near developed communities or highways have low potential for sand and gravel. Portions of the areas have moderate to high sand and gravel potential, but these areas are more remote from communities and highways (see Map 3-7). The priority wildlife areas cover a total of 231,419 acres.

Restricting sales from desert tortoise Category I habitat should not have a great impact on mineral material sales as this habitat has low potential for sand and gravel (see Map 3-7), but covers a large area (84,000 acres). The potential for decorative rock is unknown and these resources would not be developed.

Allowing mineral material sales within the lambing grounds with the condition that operations are only permissible from July 1 to December 31 would benefit Salable minerals. This decision makes more areas available for development, some of which are near growing communities at least part of the year. These areas have low potential for sand and gravel because they are located within the more mountainous areas and there is unknown potential for decorative rock (see Map 3-7).

The restriction of mineral material sales within the bighorn sheep lambing grounds would not benefit Salable minerals. Although there is low potential for sand and gravel and unknown potential for decorative rock these resources, if present, would not be developed (see Map 3-7). Some of the lambing grounds are near growing communities.

A designation of no surface occupancy for mineral leasing on bighorn sheep lambing grounds and within 40 acres of springs in priority wildlife habitats (which together cover 18,730 acres) should not have a large impact on mineral leasing. There is no known leasable mineral potential for these areas (see Map 3-9). No surface occupancy results in a higher cost for drilling because directional drilling would need to be employed to reach the mineral beneath the surface. Historically, there has been no interest in mineral leasing in these areas.

A no surface occupancy stipulation for leasable minerals on lands within 0.25 mile of the Colorado and Bill Williams Rivers and the riparian areas may impact leasable minerals. The Colorado River area is prospectively valuable for oil and gas potential (Stipp and Dockter 1987), but the Bill Williams River area has no known leasable mineral potential (see Map 3-9). The cost of mineral exploration would be higher within the Colorado River corridor.

The time restriction for all exploration and major construction work for mineral leasing would be confined to the dates of July 1 to December 31 for areas defined as bighorn sheep lambing grounds. This restriction should not have a great impact. There is no known leasable mineral potential for these areas (see

Map 3-9). No surface occupancy results in a higher cost for drilling because directional drilling would need to be employed to reach the mineral beneath the surface.

All reclamation activities would be required to use native species, which may raise the cost of reclamation for the miners.

The 28,174-acre lambing grounds and associated buffer zone restricting mining activities in and around the lambing areas in the Little Harquahala and Harquahala Mountains could cause mining to be more costly due to time constraints. Activities such as drilling and blasting and earthwork may only be allowed from April 16 to December 14, which may not work with miners' schedules and may be more costly.

From Visual Resources Management

The VRM Classes I and II would likely affect the level of development of mineral resources. It would be difficult for minerals to be developed even on a small level in VRM Class I areas because the activity must not attract attention and could only minimally change the landscape. Activities in VRM Class I could be screened/camouflaged so they do not attract attention and could have high reclamation standards so the landscape hasn't been changed. Wilderness areas in all of the alternatives are managed as VRM Class I. The wilderness areas do not allow development of mineral materials and leasable minerals. Existing mining claims could potentially be developed if the claim was valid. There are very few existing claims within wilderness and the VRM class could affect the development of the mine if the claims were found to be valid. Mineral activities in VRM Class II would have to retain the existing character of the landscape and the level of change should be low. Activities in VRM Class II may also need to be screened to retain the overall visual quality, and reclamation standards would also be strict to insure only slight changes occur to the existing landscape. It would most likely cost more for minerals to be developed in VRM Class I and II areas because the operator would have to meet the class standards with screening the operation and have more requirements for reclamation.

Development in VRM Classes III and IV would not be as restrictive as Classes I and II. Mineral development within VRM Class III could partially change the existing character of the landscape but the level of change should be moderate. Small- and medium-scale mineral developments should be able to conform easily to VRM Class III specifications. Reclamation requirements would not be as strict as with VRM Class I and II areas since the overall change could be moderate. Large-scale activities may need to screen some of their operations so there is the appearance of only a moderate change to the landscape. Larger operations in VRM Class III may also be required to have stricter and more reclamation measures so that there is only a moderate change to the landscape. Mineral development activities within VRM Class IV could easily operate at any level because there can be major modifications to the existing character of the landscape and the level of change can be high.

Alternative 3 would benefit mineral development the most because 1,040,100 acres are allocated to VRM Classes III and IV, which is 76% of the field office. Alternative 4 would be the second-best alternative with `981,900 acres allocated to VRM Classes III and IV. Alternatives 1 (No Action) and 5 (Preferred) are similar with acreages in VRM Classes III and IV at 935,900 and 930,789 acres, respectively. Alternative 2 would be the least beneficial to mineral development because only 592,200 acres would be in Class III and IV, which is only 43% of the field office. The individual VRM class acreage allocations for each alternative are detailed on Table 2-33 and Maps 2-47 through 2-51 show the alternatives for the VRM classes within the field office.

From Wilderness Characteristics

The allocation of areas for wilderness characteristics may have slight impacts on Salable minerals. In Alternatives 5 (Preferred) and 3, mineral materials could be developed within lands with wilderness characteristics when there would be no lasting impacts to solitude, unconfined recreation, and naturalness. This approach could allow for very small-scale mineral development within those areas while protecting the wilderness characteristics of the area. In Alternatives 2 and 4 mineral material sales would be restricted from lands allocated for wilderness characteristics. The majority of the wilderness characteristics areas have low potential for sand and gravel (see Map 3-7).

The allocation of areas allocated for wilderness characteristics should not impact leasable minerals because there are no known areas with leasable mineral potential within those areas.

From Special Area Designations

Subject to valid existing rights at the time of designation, all wilderness areas are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto.

Areas designated as ACECs require a plan of operations be filed for all locatable mining activity that would exceed casual use per 43 CFR 3809. A Plan of Operations could be more costly and time consuming for the miner to file and would take more time for BLM to process than a notice would.

The alternatives contain minerals decisions written to protect resources within the SADs from mineral development and therefore mineral development is restricted in those areas identified. The alternatives vary with Alternative 3 being least restrictive and the other alternatives provide varying levels of restrictions to mineral development in regards to resources within the SADs. Impacts by decision are in the paragraphs following Table 4-25.

Table 4-25. Comparison of Special Area Designations Protected by Alternative

	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Salable Minerals	Cactus Plain WSA	Cactus Plain WSA	Cactus Plain WSA	Cactus Plain WSA	Cactus Plain WSA
Restricted areas	Crossman Peak Natural Scenic Area Riparian zones of the Three Rivers ACEC	All Designated ACECs		All Designated ACECs	Bullhead Bajada ACEC Beale Slough ACEC
Leasable Minerals	Three Rivers Riparian ACEC	Cactus Plain WSA	Cactus Plain WSA	Cactus Plain WSA	Cactus Plain WSA
Areas with a No Surface Occupancy Stipulation		Riparian zone of Three Rivers Riparian ACEC	Riparian zone of Three Rivers Riparian ACEC	Riparian zone of Three Rivers Riparian ACEC	Riparian zone of Three Rivers Riparian ACEC
Locatable Minerals	Riparian area of Three Rivers ACEC	Riparian area of Three Rivers ACEC	Riparian area of Three Rivers ACEC	Riparian area of Three Rivers ACEC	Riparian area of Three Rivers ACEC
Areas Recommended for Withdrawal		Portion of Bullhead Bajada ACEC		Portion of Bullhead Bajada ACEC	Portion of Bullhead Bajada ACEC

Restricting mineral materials sales within the Cactus Plain WSA may have an impact on Salable minerals because the area has a high potential for sand (Tosdal et al 1990).

Restricting mineral material disposals within the Crossman Peak Natural Scenic Area, which covers approximately 26,193 acres, could have an impact on Salable minerals. Portions of the Scenic Area, especially in the lower elevations, have mineral material resources for decorative rock and sand and gravel and these resources would not be developed and are near a growing community.

Restricting mineral material disposals within the riparian areas of the Three Rivers ACEC, which covers 238 acres, should not have a great impact on Salable minerals. This area is located between the Swansea and Rawhide Wilderness areas and is very remote. The riparian area is very close to the Bill Williams River and additional permits may be needed that could raise the cost of operation.

There is a very low probability of someone wanting to remove material from this area due to its location. The needs could be met elsewhere.

Restricting mineral material disposals within all designated ACECs could impact Salable minerals. Some of the ACECs are near population centers and have existing disposal areas. Persons may have to travel further to reach suitable sites. There are areas of known resources that would no longer be developed. Some of the ACECs are in more remote locations that would have had a lower probability of being developed.

Restricting mineral material disposals from the Bullhead Bajada and Beale Slough ACEC may impact Salable minerals. The Bullhead Bajada ACEC is near a large population center and has moderate to high mineral material resources for decorative rock and/or sand and gravel. Sand and gravel resources within the Beale Slough ACEC would not be developed.

A no surface occupancy stipulation for mineral leasing on the Cactus Plain WSA and within the Three Rivers ACEC should have little impact because there in no known potential for leasable minerals in that area. The cost of exploration and development would increase due to this restriction but there should be little to no interest.

Withdrawing approximately 238 acres of minerals from the Three Rivers ACEC and approximately 185 acres within the Bullhead Bajada ACEC may impact locatable mineral development. This area has high and moderate mineral potential (see Map 3-8). Valid and existing rights would be maintained for claims at the time of withdrawal.

There would be no authorized mineral material disposals within the four areas managed under special prescriptions (Whipple Mountains, Lake Havasu Aubrey Hills, Gibraltar Mountains [now wilderness], and Cactus Plain), which cover 172,293 acres. There are some areas that have medium to high potential for sand and gravel and these resources would not be developed (see Map 3-7).

Cumulative Impacts

There would be continued pressure for mineral material locations near communities to support development. Existing sites could be mined out and new locations would have to be developed. It may be more difficult to find a suitable site because portions of the lands will be closed to mineral material development, which could result in a negative economic impact because materials may have to be mined at a greater distance and under more constraints. Locatable mineral exploration and development should not be greatly affected because there are very few areas that are proposed to be withdrawn. There may be more constraints on development because of other resource values that may need to be mitigated. Leasable mineral exploration and development should not be greatly affected because areas that have potential do not have many restrictions.

Impacts on Lands and Realty Management

There are more than 1.3 million acres of federally owned lands under BLM administration in the LHFO planning area. The Lands and Realty (L&R) program consists generally of two distinct segments: Land Tenure (LT) and UA. The LT segment focuses on acquiring and disposing of lands or interests in lands. The UA segment focuses on allowing a variety of uses of public lands through issuance of ROWs, leases, or permits.

This analysis provides for the evaluation of potential impacts to the L&R program from the various alternatives and resources. The analysis will focus on LT adjustments and the issuing of UAs for ROWs, permits, and leases. Examples of ROWs, permits, and leases include but are not limited to communication facilities, roads, utility lines, pipelines, apiary permits, agricultural, concession, and R&PP leases.

LT adjustments include the disposal of public lands by sale, exchange, or the patenting of R&PP leases. Most of the lands identified for disposal occur near existing communities.

Acquisition of land is also part of the LT program. LHFO may acquire property from landowners willing to exchange, donate, or sell their land to BLM. LHFO will use the criteria that would enhance the management of significant resources as the basis for the acquisition of lands. The level of these impacts is dependent on the amounts of land that become available for acquisition.

No impacts to the L&R program are anticipated from the following programs: Fire Management, Areas Allocated for Wilderness Characteristics, Wild Horse and Burro Management, Paleontological Recourses, Transportation and Public Access, Lands and Realty, Vegetation Management, Minerals Management and Special Area Designation.

From Cultural Resources

Some of the lands identified for disposal contain significant sites eligible for listing on the NRHP. Prior to the disposal or lease of these lands, additional surveys will occur and they will likely identity additional cultural resources. LHFO will develop mitigation measures for the new and existing sites. These mitigation measures may recommend the removal of some of these lands from disposal or lease category. Other protective mitigation measures might include collection of the site or a protection easement attached to the title deed. These mitigation measures, including the removal of land from the disposal list should limit the impacts to the L&R tenure program.

BLM would continue to issue leases/permits and ROWs for land use activities such as roads, power and telephone lines, communication equipment, temporary use permits, leases, land use permits, and easements for areas that are not

identified for avoidance or exclusion. BLM would provide mitigation measures to UA to minimize impact to Cultural Resources.

From Rangeland Management/Grazing

When public lands are disposed of or devoted to a public purpose that precludes livestock grazing, the permittees and lessees shall be given 2 years' prior notification. A permittee or lessee may unconditionally waive the 2-year prior notification requirement. However, if the permittee or lessee does not sign the 2-year prior notification wavier LFHO may still dispose of the parcel(s) after the waiting period. Therefore, Grazing Management should not have a direct or indirect impact other than adding as much as 2 years to the land disposal process.

From Recreation Management

If BLM disposes of lands that have been previously used for SRPs for competitive and organized group activities, LHFO would work with the applicant(s) to find other public lands for their activities. Therefore, some impacts are anticipated.

Prior to the disposing of the lands identified for the purpose, BLM will review the ROS classification of the land. This review may remove some of the land from being disposed of or BLM may possibly provide restrictions to the use of the land in the deed. Therefore an impact may occur. The level of impact will be dependent on the amount of land classified to the higher ROS settings.

BLM may issue leases/permits and/or ROWs (i.e., Use Authorizations) within the existing or proposed SRMAs or RMZs. These stipulations may limit the impacts from recreation activities within existing and proposed SRMAs or RMZs.

From Biological Resources

BLM's policy is to not dispose of lands occupied by listed or proposed threatened or endangered species. If other public uses outweigh the value of a parcel, such as a federally owned threatened or endangered species habitat, disposal may be considered on a case-by-case basis. In this instance, consulting or conferring with the U.S. Fish and Wildlife Service under Section 7 of ESA would be required. Exchange for other parcels of threatened and endangered habitat would be encouraged. Compensation for loss of habitat value would be required where a compensation policy exists. Other mitigation may also be required. This policy should not have a direct impact to the L&R program as the program will still have the ability to dispose of land.

BLM will comply fully with the Endangered Species Act of 1973, as amended, as it relates to the tortoise population and habitat management on the public lands. Under Section 2 of ESA, BLM will manage those populations and habitats of unlisted species (such as the Sonoran population of the desert tortoise) in a manner that ensures species do not become threatened or endangered through human actions. Where practicable, BLM will allow no net loss in quantity or quality of important tortoise habitats. Unless it is clearly in the national public interest and losses can be mitigated, BLM shall retain Category I and II tortoise habitat areas.

BLM's policy would be to not dispose of riparian-wetlands (riparian) lands. However, some of the lands identified for disposal may have riparian values. LHFO may remove the entire parcel or only the riparian portions of the parcel from the disposal list. If LHFO decides to dispose of lands with riparian value BLM may add protective stipulations to the deed to protect riparian values. BLM may also exchange these riparian lands for other parcels that have riparian value. Compensation for loss of riparian values may be required.

With 1.3 million acres of BLM-administered land within the planning area, some direct or indirect impacts to the L&R disposal program may occur from biological resources.

From Visual Resource Management

Prior to disposal of identified lands, BLM will review the visual resource classification of the land. This review may remove some of the land from being disposed of or BLM may possibly provide restrictions to the use of the land in the deed. Therefore an impact may occur. The level of impact will be dependent on the amount of land classified to the higher VRM ratings.

Cumulative Impacts

Growth in the LHFO area should continue into the foreseeable future. Sixty four percent of the planning area is public land; however, within the Colorado River corridor private, tribal, and state-owned properties compose the majority. This is where a majority of the growth is concentrated. However, there are large blocks of private land, particularly in the vicinity of Wenden, Salome, Hope, and Brenda, which are being developed. In these growth areas, it is anticipated that the L&R program will have requests for the disposal of adjacent public land. Prior to the disposal of public land BLM will conduct a site-specific inventory on the land to determine what, if any, conflicts will occur with other BLM programs. These inventories may reduce the amount of land initially identified for disposal; however BLM should be able to dispose of public land.

These growth areas currently have created a high demand for UA permits. It is anticipated that this demand will continue for the life of this plan. Since UA permits will continue to be issued consistent with mitigation stipulations the

L&R program anticipates that it continue to issue UA permits for the life of the plan.

Impacts on Transportation and Public Access

This analysis covers motorized and non-motorized access for all public land users including commercial and recreational users (OHV, hiking, biking and equestrians). Impacts to these resources can be characterized as those allocations or actions that result in a change in the connectivity in regional transportation, and/or access to public lands.

In some way every resource impacts Transportation and Public Access; however these impacts pertain to the development and implementation of the route evaluation and designation process. Where other resource concerns take higher precedence though conservation law, protective measures, and management objective, the effects on Transportation and Public Access will manifest themselves in the final designations placed on specific areas and routes.

No significant impacts are anticipated on Transportation and Public Access from the following resources, beyond those impacts that influence the route evaluation process: Paleontological Resources, Fire Management, Areas Allocated for Wilderness Characteristics, and Wild Horse and Burro Management.

Data on miles, acreages, and number of routes was derived from the 1997-2004 route inventory data being used on this plan.

From Cultural Resources

OHV use on cultural resource sites and site complexes managed for Conservation for Future Use, Traditional Use, and Public Use would be restricted to open roads and trails. Due to the presence of these significant cultural resources, the route network in the vicinity of these sites may be more restrictive than in other areas of LHFO. Although no management actions are identified that have an impact on Transportation and Public Access beyond the OHV restrictions, impacts may occur through the allocation of lands to different categories. Small areas of land may be closed to public access, for example. The extent of such actions is unknown until specific protections for cultural resources are prescribed.

From Rangeland Management/Grazing

The impacts from Rangeland Management/Grazing are limited to the safety hazard of animals crossing routes and the construction of rangeland improvements (e.g., fences). New fences could transect existing routes and effectively close them unless cattle guards are installed at the intersection of

fences and routes. Fences also create an impression of closed lands, which potentially affects the public's perception of what is available for their use.

From Lands and Realty

The impacts on Transportation and Public access from Lands and Realty alternatives are difficult to define: although disposing and acquiring of land creates a change in ownership, it does not necessarily change the transportation and public access value of that land.

Land disposal may generally impact routes transecting these lands and the connectivity of the lands surrounding specific disposals. Actual impacts are indefinable as specific effects and depend on the specific lands disposed of and the use prescribed to that land by the new owner. Effects must therefore be addressed on a site-specific basis. The potential for impact is obviously greater, however, where more land has been identified for disposal (see Table 4-26).

Table 4-26. Impacts on Transportation and Public Access from Land Disposals

	Alternative				
	1 (No Action)	2	3	4	5 (Preferred)
Potential Disposal Acreages	51,949	34,159	83,475	56,715	56,715
Miles of Routes in Disposals	89	119	184	95	95

Acquiring lands may also impact transportation and public access by increasing the value of transportation routes and by improving the connectivity of surrounding parcels of land.

Rights of Way

New ROWs and utility corridors have the potential to create new routes and opportunities for public access, but under certain circumstances (e.g., the fencing of ROWs or utility corridors) ROWs could also truncate/interrupt existing routes. Without mitigation, such actions would reduce the opportunity for public access. For this reason, impacts are defined and limited to the extent to which the public is not impeded in any of the alternatives.

From Minerals Management

In relation to Transportation and Public Access, Minerals Management can be considered in two aspects. First, mineral exploration and extraction directly influences traffic and route development; second, mining operations indirectly affect public accessibility, recreational routes, and perceived quality of the environment.

There are two general impacts on transportation and public access from Minerals Management:

- The development of new mines or expansion of existing developments could cause increased traffic on routes within the LHFO transportation network. The development of new mines, the expansion of existing mines and the exploration of mineral deposits could remove/hinder public access to these areas and interrupt routes that transverse these locations.
- All of the alternatives restrict the areas where mineral operations are permitted, and impacts on Transportation and Public Access are only present when mining operations or activities occur. Because of the geological nature of LHFO, only a few such instances are expected over the life of this plan.

From Recreation Management

Transportation and Public Access are linked closely with recreation. Public access to the lands is in itself recreational experience in all its diverse expressions, which include OHV activity, equestrian exploration, and hiking experiences. Recreational alternatives logically have many impacts on this resource; however, the full extent of these impacts depends on the steps that are taken in the route evaluation and designation process.

Within SRMAs and RMZ, transportation and public access could be impacted by the desired goals and objectives and the management approach delineated in activity-level plans for the areas. The use of ROS in the development of desired future conditions for these RMZs will guide the route evaluation process. Losses and gains to public access and the transportation network could result.

Recreation management that seeks to promote and enhance transportation and public access by providing interpretive media (e.g., maps and information) improves transportation and public access, and increases public awareness of resources, public safety concerns, and “tread lightly” ethics by educating the public. Specifically, management to promote OHV use within the Standard Wash and Osborne Wash areas will result in safer opportunities for OHV exploration and an enhanced travel network within these areas and will improve associated facilities (e.g., trail heads, restrooms and directional signage).

Recreation Management that gives priority to other resource concerns such as biological and cultural resources can impact the travel network and opportunities

for public access; however, these impacts are again dependent on route evaluation and the resulting route designations.

From Transportation and Public Access

On the whole the transportation and public access alternatives have been conceived for the enrichment of this resource and the protection of public safety and other resources. Many of the decisions within the Transportation and Public Access alternatives have been driven by the need to prioritize other resource concerns over those of this program (e.g., cultural and biological resources). This prioritization derives from conversation laws and management goals and objectives for the protection and enrichment of these resources. Impacts are expected from these decisions; however, the level of these impacts cannot be determined before the evaluation process is completed subsequent to publication of this RMP. Restoration of routes not found on the 1995–2004 inventory before the completion of the evaluation process could impact transportation, since new routes might have appeared subsequent to completion of the inventory.

From Biological Resources

Protection and enhancements of biological resources will have numerous impacts on transportation and public access. Many of these impacts are limited to areas designated WHA and to several classes of species-specific habitat. Alterations to the size of these areas have obvious implications on the extent of land areas affected. Allocation of lands as WHAs at its fullest extent would affect approximately 2,072 miles of existing routes and trails. The management prescribed in some of the alternatives includes seasonal limitations, route closures, restrictions to public access, and the connectivity between areas of the LHFO planning office. Many of these restrictions are undetermined until the process of route evaluation occurs. This process is interdisciplinary in nature and the resulting designations will be a consensus among resource staff with input from the public. In addition, several alternatives indicated that only compatible uses will be allowed and activities that jeopardize or endanger habitat or species will be prohibited. Impacts are difficult to specify, as their nature depends on acceptable territorial limits for each species and the formal management assessment of the compatibility of specific activities with conservation objectives.

The construction of wildlife movement facilities such as overpasses, underpasses, culverts, and fencing may greatly alter the transportation network within the LHFO planning area. These impacts could conceivably included interruption and alteration of existing routes by these new wildlife resource developments. The extent of this outcome is undefined and therefore its overall impact is unknown.

Impacts are also regulated by the seasonal activity of species. The level of these impacts is difficult to define as it is species-specific and dependent on the management prescriptions implemented on these areas. For example:

- 58 miles of routes in the LHFO planning area that intersect bighorn sheep lambing grounds would be closed for the period January 1 to June 30 (also the period of greatest recreational use), thus reducing public access. Although the transportation value of these existing routes is undetermined, several provide connectivity between different areas of public land.
- 618 miles of routes cross-allocated wildlife corridors and would be subject to the management prescriptions of those areas.
- 210 miles of routes cross woodland areas that the decisions seek to protect.

The above examples provides a general indication of the extent of routes within those specific areas, but does not truly show the impact to those routes: every route will undergo the route evaluation process and as such will be designated as open, closed, or limited.

The shoreline of Lake Havasu consists of approximately 21 miles of public lands that contain 87 high-demand campsites available only by boat. The implementation of no-wake zones in this recreational resource would negatively affect the quality of boating-related activity by creating confusion and frustration. The creation of the no -wake zone is beyond the jurisdiction of the BLM.

From Visual Resource Management

Managing for VRM could potentially cause future impacts on Transportation and Public Access. Making management decisions to reflect the desired visual class could influence the route designation process and reduce the overall route network. BLM's ability to manage based on the VRM class over consistently dense motorized use areas with varying management practices would be virtually impossible. It is not possible to predict the level of impact this outcome would have on transportation and public access until the route designation process is started.

From Special Area Designations

Areas of Critical Environmental Concern

The development of ACECs within the LHFO planning area does not directly impact transportation and public access; however, the management actions prescribed to these areas could have great impacts on the existing transportation network and public access to these lands designated as ACECs. Management actions to protect these designating values, especially specific cultural sites not allocated as Public, may limit or constrain public access to public lands in these ACECs and the travel networks that cross these areas.

Approximately 112 miles, or 90%, of the routes within ACECs would be closed; the selection of routes to remain open would be based on maintenance of

connectivity of touring routes that do not impact the resources of the ACEC. Although the resources identified for protection in ACECs are generally located in areas without a large number of routes, connectivity in the immediate local route network could be reduced.

Back Country Byways

There are obvious implications on transportation and public access from any management action that involves Back Country Byways. The designation of new byways has the potential to increase the traffic on these routes due to the scenic, historic, or public interest nature of these roads. The development of new Back Country Byways also may increase the amount and ease of public access to these areas.

Cumulative Impacts

There are many difference influences and pressures on the Transportation and Public Access systems within the management area. The ever-increasing urban populations, the growing list of threatened or endangered species, and the demand on the land from other resource uses all contribute to a substantial change in the traditional public lands use ethic. These cumulative effects reduce the amount of public land available for unrestricted use, disrupt the existing transportation network, decrease the opportunity for motorized recreation, and impede public access to these lands.

The increased cost of fuels and equipment necessary to take advantage of these travel opportunities greatly affects the amounts and type of uses that these transportation systems are supporting. In addition, it is foreseeable that there will be future impacts from environmental regulations and interest groups that greatly influence the establishment and designation of areas of public access and the transportation network as a whole.

The end result is the necessity to provide the public with a high-value, connected transportation network and increased ease and opportunity to access public lands.